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A FURTHER EVALUATION OF ARTIFICIAL PNEUMOTHORAX IN LOBAR PNEUMONIA

CHAIRMAN'S ADDRESS

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In previous reports [1] on the treatment of lobar pneumonia with artificial pneumothorax it was pointed out that no evidence of beneficial effect on the duration or outcome of the disease was obtained in late cases of more than seventy-two hours' duration or in earlier cases with pleural adhesions which prevented adequate collapse and immobilization of the involved lung. Of fourteen late cases eight showed spread to other lobes, empyema developed in two and there were nine deaths. In twelve early cases with adhesions the expected duration of the disease was not obviously shortened in eleven, four showed further spread of the pneumonia, empyema developed in two and there was one death.

Of the total group of forty-two cases there remained sixteen without pleural adhesions in which treatment was started prior to seventy-two hours after onset. Concerning six of these, first treated between forty-eight and seventy-two hours after onset, it was stated that, although all appeared to be benefited, the apparent prompt improvement was of doubtful significance in view of the early appearance of antibodies in three and the occurrence of relapse after initial improvement in two. Of the remaining ten, first treated prior to forty-eight hours after onset, all showed relief of symptoms with prompt recovery by crisis in five and apparently accelerated recovery by lysis in four. In none could the short course be attributed to the early appearance of antibodies. In spite of the noteworthy fact that none of these ten patients happened to be bacteremic, the response nevertheless seemed sufficiently encouraging to warrant further study in an effort to reach a more definite opinion concerning the possible value and already fairly obvious limitation of artificial pneumothorax therapy. With this in view thirty additional cases have been treated, the pertinent data being presented in tables 1 and 2. The procedure followed was that previously described,[1] namely the induction and maintenance of complete collapse of the lung on the involved side, so far as this was possible.

Analysis of the results in these additional cases serves first to confirm the limitations previously pointed out. Of the thirty cases, three (10, 11 and 12, table 1) were treated later than seventy-two hours after onset. One, patient 10, showed further spread of the pneumonia and died. One, patient 11, though promptly relieved of pleural pain, had an otherwise natural course, recovering by lysis concurrently with the appearance of agglutinins in the blood, while the third, patient 12, also promptly relieved of pleural pain, had an immediate crisis; but this was not unexpected, as a pseudocrisis had already occurred on the fourth day. Nine earlier patients, also shown in table 1, turned out to have pleural adhesions which prevented adequate collapse. In none of these was the course favorably affected. Six had spread of the pneumonia to other lobes, one had empyema, six died.

There remain eighteen cases without pleural adhesions in which treatment was initiated prior to sixty hours after onset (table 2). Of these, four (13, 21, 25 and 28) showed prompt recovery by crisis, but patient 21 must be eliminated because of simultaneous treatment with type I antipneumococcus serum. Seven other patients (17, 19, 22, 23, 24, 27 and 29), three of whom were bacteremic, appeared to be clinically improved and recovered by lysis without further spread of the pneumonia. On the other hand the clinical course was not favorably modified in seven. Four of these showed further spread of the pneumonia, two had empyema, and three died.

COMMENT

Analysis of the course of events in the total series of thirty-three [2] early cases in which pleural adhesions were not present, summarized in table 3, would seem to suggest that artificial pneumothorax treatment is of definite value not only in providing relief from pleural pain but also in beneficially affecting the course and outcome of the disease in those cases in which satisfactory collapse can be promptly established. Recovery of approximately one half of the patients before or by the fifth day indicates a much shorter average duration than usual and the case fatality percentage is quite low. Furthermore, comparison of the results with those in the concurrently treated group of early cases in which pleural adhesions were present so that adequate collapse could not be established, shows a striking contrast between the two groups with respect to duration of the acute febrile stage, frequency of further spread of the pneumonia, subsequent development of bacteremia, inci-

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1. Blake, F. G.; Howard, M. E., and Hull, Winifred S.: Tr. A. Am. Physicians **49**: 119, 1934; Artificial Pneumothorax in the Treatment of Lobar Pneumonia, J. A. M. A. **105**: 1489 (Nov. 9) 1935.

2. Case 21 excluded because of simultaneous treatment with type I antipneumococcus serum on the second day.

dence of empyema and the number of deaths (table 3). Obviously, however, an analysis of factors other than the absence or presence of pleural adhesions which might have influenced the results is essential before the apparently good results in the group without pleural adhesions can justifiably be attributed to treatment with artificial pneumothorax. Some of the factors which can be compared are the relative frequency of the different pneumococcus types, the distribution of cases according to age, the time in twenty-four hour periods after onset when treatment was started, the number of lobes already involved when treatment was begun, and the presence in the group with adhesions as in the group without adhesions. In only one important respect does the group without adhesions lack a chance advantage, namely in the proportion of patients initially bacteremic, but even here the apparent equivalence must be discounted as one of the three type I bacteremic patients in the non-adhesion group received antipneumococcus serum simultaneously with pneumothorax therapy and three had infections due to pneumococcus types IV, VIII and XXXI, respectively, with blood cultures which showed less than one colony per cubic centimeter of blood, while two of the three bacteremic patients with pleural

TABLE 1.—*Cases with Pleural Adhesions and Late Cases*

	Clinical Data				Pneumothorax Treatment			
Patient	Age	Pneumococcus Type	Blood Cultures	Site	Begun, Hours After Onset	Number of Treatments	Total Amount of Air, Cc.	Results Clinical Course Following Treatment
1. P. C.	84	III	− +	L.U., L.L.	17	3	1,350	Bacteremia developed, died 3d day
2. E. W.	32	XIII	−	L.L.	25	3	1,400	Spread to L.U., recovered by lysis, 9th day
3. R. C.	44	I	+	R.U., R.M.	26	2	550	Progressively worse, died 3d day
4. P. Co.	52	III	−	R.U.	26	3	2,250	Spread to L.L., died 6th day
5. W. W.	18	I	−	R.M.	32	3	2,650	Empyema developed, thoracotomy, recovered
6. A. F.	58	I	− +	R.U.	33	2	1,650	Spread to R. L., bacteremia developed, died 7th day
7. G. B.	55	IV*	+	L.L.	35	3	1,550	Contralateral spread, died 5th day
8. C. M.	47	I	−	R.L.	48	2	1,750	Spread to L.L., type I serum, recovered 6th day
9. J. H.	63	III	−	R.U., R.M.	70	5	3,050	Spread to L.L., died 7th day
10. M. S.	27	I	+	L.L.	84	1	600	Contralateral spread, type I serum, died 5th day
11. J. R.†	29	IV	−	L.U., L.L.	84	1	600	Pleural pain relieved, recovered by lysis, 11th day
12. V. W.†	28	IV*	−	R.M.	90±	1	500	Pleural pain relieved, prompt recovery by crisis, 5th day

* Pneumococcus group IV, type not determined.
† No adhesions; one treatment for relief of pleural pain.

TABLE 2.—*Early Cases Without Pleural Adhesions*

	Clinical Data				Pneumothorax Treatment			Results			
Patient	Age	Pneumococcus Type	Blood Cultures	Site	Begun, Hours After Onset	No. of Treatments	Total Amount of Air, Cc.	Clinical Course Following Treatment	Day	Spread	Complications
13. J. Mc.	64	XIX	−	L.L.	12	5	2,250	Prompt recovery by crisis	3		None
14. J. R.	38	XI	−	L.U.	18	3	3,100	Unimproved, recovery by lysis	5-7	R.U.	None
15. M. K.	32	VII	− +	R.U.	20	4	2,300	Contralateral spread, bacteremia, died	5	L.L.	None
16. A. De.	48	VIII	−	R.U.	20	3	2,150	Unmodified, recovered	...	—	Empyema
17. M. W.	20	IV*	−	R.U.	24	5	1,800	Improved, recovery by lysis	4-9	—	None
18. S. R.	17	I	+	L.L.	25	3	2,800	Progressively worse, died	6	R.L., R.U.	Empyema
19. W. C.	37	XXXII	−	L.L.	25	4	1,700	Marked improvement, mild relapse, recovered by lysis	5-8	—	None
20. A. C.	45	I	+ −	L.L.	30	6	2,425	No benefit, type I serum, recovered	8	—	Sterile pleural effusion
21. F. C.	18	I	+ −	L.L.	32	3	2,350	Type I serum, 2d day, recovered by crisis	3	—	None
22. B. G.	30	XXXI	+ −	R.U.	34	4	2,050	Improved, recovered by lysis	4-7	—	Sterile pleural effusion
23. E. B.	30	IV	+ −	R.L.	35	2	1,950	Improved, recovery by lysis	3-5	—	None
24. A. G.	26	III	−	R.U.	40	4	2,300	Improved, recovery by lysis	3-8	—	None
25. T. V.	48	XXXII	−	L.L.	41	3	1,300	Prompt recovery by crisis	3	—	None
26. C. H.	75	III	−	R.U.	42	2	1,100	Progressively worse, died	6	R.L., L.L.	None
27. J. Y.	29	X	−	R.M.	50	5	4,425	Marked improvement, mild relapse, recovered by lysis	6-9	—	None
28. R. M.	42	VIII	−	R.L.	53	1	600	Immediate recovery by crisis	3-4	—	None
29. E. I.	51	VIII	+ −	R.U.	54	1	700	Improved, recovery by lysis	5-6	—	None
30. B. P.	38	I	−	L.L.	56	3	1,450	Unmodified, recovery by crisis	7	—	None

* Pneumococcus group IV, type not determined.

of bacteremia prior to treatment. From the analysis shown in chart 1, it is at once apparent that a smaller proportion of the cases without adhesions were due to types I, II and III pneumococci, a much larger proportion to the other types than was the case in the group with adhesions. It also happens that the ratio of younger patients under 40 years of age to older patients is nearly twice as large in the group without adhesions as in the group with adhesions. Furthermore, nine of the former group were treated within twenty-four hours after onset as contrasted with only one of the latter group, a fact which might provide a chance advantage to the group without adhesions, at least so far as earlier recovery is concerned. Finally, the proportion of patients with more than one lobe involved when treatment was started is six and a half times as great adhesions showed ten and thirty-four colonies per cubic centimeter, respectively.

In spite of these several advantages possessed by the group without pleural adhesions, comparison of the two groups subdivided according to pneumococcus type, time of treatment and age still shows in each comparable subdivision a much better result in the group without adhesions (table 4), which might seem to justify the conclusion that artificial pneumothorax therapy is of definite value in lobar pneumonia. For example, of fifteen patients without adhesions treated between twenty-four and forty-eight hours after onset, of which five were bacteremic, six had recovered on or before the fifth day as contrasted with none of the ten with adhesions, of which only two were bacteremic. Similarly, of eighteen patients without adhesions, from 30 to 49 years of age,

nine had recovered by the fifth day or earlier as against none of the twelve patients with adhesions.

A really critical evaluation, however, demands that all the favorable and unfavorable factors enumerated which might influence the outcome independently of pneumothorax therapy be simultaneously taken into consideration. If this is done, as shown in chart 2, it will be found that eight, or 23.5 per cent, of the group without adhesions as against one, or 4.8 per cent, of the

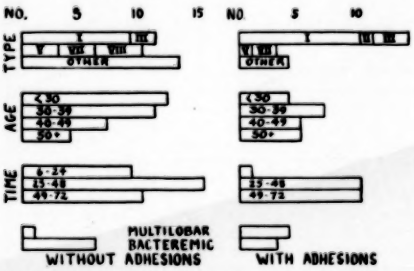

Chart 1.—Distribution of cases according to pneumococcus type, age, time of treatment in hours after onset, involvement of more than one lobe and bacteremia.

group with adhesions fall into the most favorable classification, i. e., nonbacteremic, unilobar, pneumococcus group IV patients under 40 years of age and first treated less than thirty-six hours after onset. Even more significant is the fact that seven, or 33⅓ per cent, of the group with adhesions as against only two, or 5.9 per cent, of the nonadhesion group fall into the unfavorable classification of patients over 40 with infection due to pneumococcus types I or III. Five of the seven fatal cases in the group with adhesions are found here. The analysis might be carried further but this seems hardly necessary, since it would serve only to confirm the fact,

TABLE 3.—*Summary of Results in Early Cases*

Clinical Course	33 Cases Without Pleural Adhesions*		21 Cases With Pleural Adhesions	
	No.	Per Cent	No.	Per Cent
Recovered on 3d day	5	15	0	—
Recovered on 4th day	6	18	0	—
Recovered on 5th day	5	15	1	5
Recovered on or before 5th day	16	48	1	5
Spread to other lobes	5	15	10	48
Bacteremia developed	2	6	6	29
Empyema developed	2	6	3	14
Died	3	9	7	33

* Case 21, excluded because of simultaneous treatment with antipneumococcus serum on second day.

already obvious, that the apparently favorable results in the group without adhesions cannot justifiably be attributed to the effect of artificial pneumothorax therapy but are much more probably due to the initial advantages which this group possessed.

A similar type of analysis, so essential to adequate evaluation, cannot be applied to all the cases recorded in the literature, since the necessary data are lacking in many of them. Reports [3] which have appeared since our previous review,[4] however, as most of the authors conclude, fail to provide convincing evidence that artificial pneumothorax is a curative procedure, even though symptomatic relief, particularly of pleural pain, is undoubtedly seen in many cases. Especially significant

TABLE 4.—*Results in Cases Grouped According to Pneumococcus Types, Age and Time of Treatment*

	Without Pleural Adhesions					With Pleural Adhesions				
	Number	Recovered by 5th Day	Spread	Bacteremia Developed	Empyema	Died	Number	Recovered by 5th Day	Spread	Bacteremia Developed	Empyema	Died
Type I, II, III	11	4*	3	0	1	2	14	1	6	4	3	6
Group IV	23	12	2	2	1	1	7	0	4	2	0	1
Age												
<30	12	5*	2	0	1	1	4	1	2	1	1	0
30-39	11	4	2	2	0	1	7	0	2	2	2	1
40-49	7	5	0	0	1	0	5	0	2	1	0	1
50+	4	2	1	0	0	1	5	0	4	2	0	5
Hours after onset												
6-24	9	5	2	1	1	1	1	0	0	1	0	1
24-48	15	6*	2	1	1	2	10	0	5	3	1	4
48-72	10	5	1	0	0	0	10	1	5	2	2	2

* Case 21 excluded because of simultaneous treatment with antipneumococcus serum.

is the apparent failure of artificial pneumothorax to check bacteremia consistently when present and invariably to prevent its subsequent development in patients who are nonbacteremic when treatment is instituted.

SUMMARY

Seventy-two patients with lobar pneumonia have been treated with artificial pneumothorax in an effort to evaluate the therapeutic usefulness of this procedure. It has been found to be of no value (1) in late cases of more than seventy-two hours duration and (2) in earlier cases with pleural adhesions which interfere with

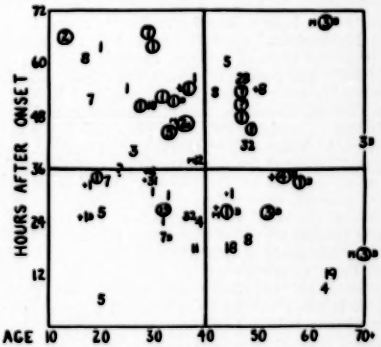

Chart 2.—Analysis of factors influencing course and outcome. Numbers indicate pneumococcus type; without circles, without pleural adhesions; in circles, with pleural adhesions; +, bacteremic; M, multilobar; D, died.

adequate collapse of the lung. These two facts alone would seriously limit its field of possible usefulness, even were it of value in early cases without pleural adhesions, since many patients do not present themselves until late and adhesions are found in approximately 30 to 40 per cent of early cases. A further important limitation is the fact that it has not been found to exert a demonstrable effect on an established

3. Klein, Thomas, and Tuck, V. L.: Am. Rev. Tubere. **32**: 511 (Nov.) 1935. Robertson, W. E.: Lancet **2**: 1282 (Dec. 7) 1935. Abernethy, T. J.; Horsfall, F. L., and MacLeod, C. M.: Bull. Johns Hopkins Hosp. **58**: 35 (Jan.) 1936. Birnbaum, G. L., and Corylios, P. N.: Pneumothorax Therapy in Experimental Lobar Pneumonia in the Dog, Arch. Int. Med. **57**: 610, (March) 1936. Howlett, J. G.; Luft, Raymond, and Astwood, E. B.: Canad. M. A. J. **34**: 387 (April) 1936. Daniels, L. P.: Schweiz. med. Wchnschr. **66**: 1260 (Dec. 12) 1936. Lynch, V. T. J.: M. J. Australia **2**: 355 (Aug. 28) 1937.

4. Blake, F. G.; Howard, M. E., and Hull, W. S.: Medicine **15**: 1 (Feb.) 1936.

bacteremia nor does it necessarily prevent subsequent invasion of the blood by pneumococci.

Although the course and outcome in the majority of thirty-three early cases without adhesions would appear, on first analysis, to have been beneficially modified by treatment with artificial pneumothorax, a careful evaluation of other factors which might have been responsible for the apparently good results renders such a conclusion untenable.

CONCLUSION

Artificial pneumothorax would appear to be of value for the relief of pleural pain in selected early cases of lobar pneumonia. It has not been demonstrated that it possesses any curative value in this disease.

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THE TREATMENT OF SUBCLINICAL AND CLASSIC PELLAGRA

USE OF NICOTINIC ACID, NICOTINIC ACID AMIDE AND SODIUM NICOTINATE, WITH SPECIAL REFERENCE TO THE VASODILATOR ACTION AND THE EFFECT ON MENTAL SYMPTOMS

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The observations of Elvehjem, Madden, Strong and Woolley [1] showing that nicotinic acid cures canine blacktongue stimulated several investigators to administer nicotinic acid to human beings with pellagra. Their reports have been reviewed elsewhere.[2] Spies, Cooper and Blankenhorn [2] recently reported that in a series of seventeen cases of pellagra, nicotinic acid, nicotinic acid amide and sodium nicotinate dramatically blanched the erythematous dermal lesions, produced healing of the glossitis, stomatitis, vaginitis, urethritis and proctitis, and reduced the amount of porphyrin in the urine to normal. These authors also described flushing, burning and itching of the skin following the administration of massive doses of these drugs. In view of these observations it seemed desirable to determine the effect of nicotinic acid, of its amide, sodium salt and diethyl amide (coramine) and of trigonelline (the methylbetaine of nicotinic acid) on manifestations of pellagra other than those mentioned and to investigate further their pharmacologic and therapeutic action. The present report is concerned with the effect of these drugs on normal human beings and on persons with pellagra, in addition to those patients previously described by Spies, Cooper and Blankenhorn.

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This investigation was aided by grants to the University of Cincinnati College of Medicine from the Rockefeller Foundation, the Josiah Macy Jr. Foundation and the Fleischman Foundation.

1. Elvehjem, C. A.; Madden, R. J.; Strong, F. M., and Woolley, D. W.: Relation of Nicotinic Acid and Nicotinic Acid Amide to Canine Blacktongue, J. Am. Chem. Soc. **59**: 1767, 1937; The Isolation and Identification of the Anti-Black Tongue Factor, J. Biol. Chem. **123**: 137 (March) 1938.

2. Pellagra and Nicotinic Acid, editorial, J. A. M. A. **110**: 289 (Jan. 22) 1938. Aetiology of Pellagra and the Nutritive Value of Maize, Lancet **1**: 282 (Jan. 29) 1938. Spies, T. D.; Cooper, Clark, and Blankenhorn, M. A.: The Use of Nicotinic Acid in the Treatment of Pellagra, J. A. M. A. **110**: 622 (Feb. 26) 1938. Nicotinic Acid and Pellagra, editorial, South. M. J. **31**: 331 (March) 1938.

MATERIAL AND METHODS

Subjects.—A total of seventy-three persons with endemic pellagra were studied at the Cincinnati General Hospital and at the Hillman Hospital of Birmingham, Ala. This number included all adults with classic pellagra admitted to either hospital between Dec. 15, 1937, and June 1, 1938. Forty-six had endemic pellagra; in sixteen pellagra developed after malnutrition resulting from other diseases, and in eleven it developed after chronic alcoholic addiction. All persons in this series had lesions of the mucous membrane diagnostic of pellagra, and fifty-six had characteristic pellagrous dermatitis. They all had lost weight, strength and appetite; fifty-one had mental symptoms, forty diarrhea, twenty-seven urethritis, twenty-four severe vomiting, twenty-three peripheral neuritis, twenty-three vaginitis, twenty-one proctitis, ten constipation and two cardiac decompensation (thought to be of the nutritional type described by Weiss and Wilkins [3]).

Observations on the children in several hundred "pellagra families" revealed that many of these children show clinical signs of early pellagra, and it therefore seemed advisable to include them in our studies. Preliminary studies indicate that the early symptoms are even more vague and difficult to recognize in the child than in the adult. The children are usually below normal in weight and height; they have made poor progress in school; they react sluggishly, and their inability to concentrate is easily noticeable. Poor appetite, indigestion, vomiting, soreness of the tongue and lips and constipation are common symptoms.

A dietary history of the family reveals that in many cases the diet of the mother during pregnancy was inadequate and that shortly after birth the child was given a formula because the mother had insufficient milk. This formula was not always adequate in the essential nutrients. Frequently the child has been a "feeding problem" since birth, refusing to take enough of the formula for his energy needs and later showing a preference for one or two foods and refusing all others. The diet has consisted almost entirely of carbohydrate foods; milk, eggs and meat either were not included or were given in insufficient quantities.

Thirty-six of the children observed had glossitis and dermatitis diagnostic of pellagra. After the administration of nicotinic acid (from 100 to 200 mg. daily) or one of its compounds, they experienced an increased sense of well being and disappearance of symptoms. Ten children without the usual diagnostic evidence of pellagra gave a similar response after the ingestion of nicotinic acid.

We interpret these observations as indicating that a slowly progressing deficiency in the antipellagra factor commonly existed in the children studied but that definite diagnostic evidence of pellagra develops late.

In addition to these patients, 199 with subclinical pellagra were studied at the Hillman Hospital. Further study of some of the reactions already noted in pellagrins following oral or parenteral administration of nicotinic acid was carried out on 100 normal adults at the two hospitals.

Method of Study.—As soon as the pellagrin in severe relapse came to either hospital, he was placed under the direct charge of one of us, who assumed responsibility for thorough clinical studies, for all indicated laboratory determinations and for therapy and

3. Weiss, Soma, and Wilkins, R. W.: The Nature of the Cardiovascular Disturbances in Nutritional Deficiency States (Beriberi), Ann. Int. Med. **11**: 104 (July) 1937.

necessary control measures. We were given invaluable assistance by the professional and administrative staffs of both hospitals and particularly by Dr. James B. McLester; Miss Jean Grant, dietitian; Miss Ann Van Blaricom, nurse; Miss Elizabeth Zschiesche, Miss Nelwyn Huff and Miss Helen Grant, technicians, and Dr. Yasuo Sasaki, E. S. Gross and S. P. Vilter, chemists. The method of study in general was similar to that previously adopted for determination of the presence of an antipellagra factor.[4] This method may be described briefly as follows: If the lesions of the mucous membranes of a pellagrin show no improvement over a period of several days while the patient's diet is restricted, they serve as an effective index for testing the potency of a potential therapeutic agent. If the substance has therapeutic value, the lesions will heal promptly when sufficient amounts of the substance are added as a supplement to the diet, all other conditions remaining constant. Repeated determinations of nicotinic acid and porphyrins in the urine were made before, during and after the period of treatment. These determinations will be reported later. Repeated smears of the lesions of Vincent's infection were made before, during and after treatment.

Dietary Management.—The seventy-three pellagrins were divided into four groups. Each subject was observed during a control period of from one to three days. The first group consisted of twenty-two pellagrins who drank water but ate no food during the test period; the second group was composed of twenty-one pellagrins who received from 100 to 200 Gm. of dextrose daily and drank water ad libitum during the control period; the third group consisted of fourteen pellagrins who were offered an ordinary hospital diet and water ad libitum (these patients refused to eat more than small amounts of food, and their lesions failed to improve); the fourth group consisted of the remaining sixteen pellagrins, who were given only a basic diet and water ad libitum for a period of from two to three days. At the end of the control period, nicotinic acid or a similar drug was given to each patient. After improvement occurred, every patient was given a well balanced, high vitamin diet.

Materials and Mode of Administration.—The nicotinic acid employed in the treatment of the pellagrins in this series was supplied by the Eastman Kodak Company, Harris Laboratories, Merck & Co., the S. M. A. Corporation, Mead Johnson & Co. and Abbott Laboratories. Synthetic nicotinic acid amide was given to two patients, and sodium nicotinate, supplied through Merck & Co., was given to five. Coramine, furnished by Ciba Pharmaceutical Products, Inc., was given in doses of from 4 to 20 cc. daily to eleven pellagrins. Some of the patients given nicotinic acid amide or coramine, after showing the same clinical response as the other patients, were later given maintenance doses of nicotinic acid. Two patients were given a total of 1 and 1.5 Gm. of trigonelline, respectively, but there was no improvement; they were then given the same amount of nicotinic acid and responded promptly.[4a] Only two of the pellagrins in this series were treated by intravenous injections of nicotinic acid, as we had shown previously that the oral method of administration is highly satisfactory. One of these patients received 10 mg. and the other 20 mg. daily for a period of four days. The oral dose of nicotinic acid and of the salts used in this study varied from a daily total of 50 mg. to 1 Gm. The individual oral dose usually varied from 20 mg. to 500 mg. We preferred to use amounts of from 50 to 100 mg., given five or six times daily. Each patient was observed carefully after the administration of any of these substances, and the pulse rate, temperature and respiratory rate were determined. Also, the patients were questioned concerning any untoward sensations, and laboratory studies were frequently made, which included blood counts, tests of the blood chemistry such as determination of the carbon dioxide-combining power, electrocardiograms, and roentgen examinations.

4. Spies, T. D.: Pellagra: Improvement While Taking So-Called "Pellagra-Producing" Diet, Am. J. M. Sc. **184**: 837 (Dec.) 1932; Observations on the Treatment of Pellagra, J. Clin. Investigation **13**: 807 (Sept.) 1934.

4a. Through the cooperation of Dr. M. K. Heath, Dr. K. U. Jones, and Dr. J. M. Bryan, veterinarians of Birmingham, Ala., nicotinic acid, nicotinic acid amide, sodium nicotinate and coramine have been used in the treatment of forty cases of spontaneous canine blacktongue. In these cases there was no dermatitis; there were no mental symptoms, and no evidence of increased porphyrinuria was produced by the method of Beckh, Ellinger and Spies. In every instance there was spectacular improvement within twenty-four to forty-eight hours.

OBSERVATIONS

Within seventy-two hours of administration of large amounts of nicotinic acid, sodium nicotinate, nicotinic acid amide or coramine to the seventy-three pellagrins, we regularly observed fading of the mucous membrane lesions, blanching of the erythema of the cutaneous lesions when present, a tendency toward the return of normal gastrointestinal function, remission of mental abnormalities when they were present and a decrease or cessation of porphyrinuria. (Two of the patients died subsequently, one from uremia and the other from obstruction of the esophagus associated with the mediastinal lymphadenopathy of Hodgkin's disease.) Soon after receiving any one of these substances, the pellagrin volunteered that he felt a sense of general well being and manifested much more interest in his disease and in conditions around him. Within the first twenty-four hours the picture of apathy and lassitude gave way to one of wide-awake interest. Likewise, the effect of nicotinic acid or one of its compounds on the alimentary tract was dramatic. Usually within twenty-four hours, sometimes a day later, there were striking objective changes in the mucosa of the mouth, throat and tongue, and in the rectum. The abnormal redness and the Vincent's infection disappeared. The appetite of some of the patients increased and the stools rapidly became normal, irrespective of whether the person had diarrhea or suffered from constipation. The amount of porphyrin in the urine, which was increased in forty-six of the forty-eight pellagrins tested, returned to normal after the administration of adequate amounts of nicotinic acid or one of its salts. The two pellagrins without increased porphyrinuria had extensive lesions of more than three months' duration. The fiery red dermal erythema of all patients blanched after the administration of nicotinic acid, but we did not note any special healing effect on the dermatitis of patients in whom the continuity of the skin had become broken and whose lesions were moist and ulcerated or dry and thickened. The vaginitis and urethritis usually disappeared within the first twenty-four hours. The two patients with cardiac decompensation showed a decrease in dyspnea, orthopnea and edema in three and four days, respectively, after the oral administration of 500 mg. of nicotinic acid and the injection of from 40 to 100 mg. of thiamin chloride (crystalline vitamin B_1 hydrochloride) daily. The peripheral neuritis present in ten of the patients was not relieved by nicotinic acid, but the pain and numbness disappeared within forty-eight hours after the injection of 50 mg. of vitamin B_1 twice

each day. This finding has been reported in detail by Spies and Aring.[5] Perhaps the most striking improvements following the administration of nicotinic acid to a pellagrin in relapse are the change in mood and personality, and the disappearance of mental symptoms. Since these changes are unusually difficult to describe, two representative case histories from those of the eighteen patients with unusually severe pellagrous psychoses are given in some detail:

CASE 1.—*History.*—I. C., a Negro widow, aged 59, had a progressive illness of at least nine months' duration. The family history and the past history are irrelevant.

About a year before admission the patient became weak and complained of vague discomfort in the epigastrium following meals, of gaseous eructations, anorexia, nausea on occasion, constipation and of weakness. She lost 15 pounds (6.8 Kg.) within the next three months. Thereafter the symptoms became progressively worse. During the two months just prior to admission to the hospital, she had little food; spent all her time in bed because of weakness; complained of soreness, particularly in the substernal region; lacked interest in her household, and did not observe her surroundings. Her memory became impaired, and she became disoriented and had hallucinations. Her family said that she didn't notice the things which she had formerly, that she often complained of seeing snakes and worms, and that she was "crazy and foolish in the head." Her food during the course of her illness consisted of decreasing quantities of turnip greens, rice, bread, syrup and milk.

Physical examination showed an emaciated Negress who appeared to be acutely and chronically ill. She had swelling and reddening of the mucous membranes of the tongue, mouth, throat and vagina. She had characteristic lesions of pellagra over the nose, forehead, dorsum of the hands, wrists, elbows, knees and feet. The tendon reflexes were equal and hyperactive. All coordinating movements were jerky. She was somnolent and depressed. When aroused, she was always confused and apprehensive, refused to cooperate and was disoriented as to time and place. Her memory was impaired so that she could not recall the trip from her home to the hospital or the names of her children.

The laboratory examinations gave essentially normal results except that the hemoglobin content was 58 per cent, the red blood cell count was 2,900,000 and large amounts of coproporphyrin were found on repeated tests of the urine.

Course in the Hospital.—During the first three days in the hospital she resisted attention, would not take food and remained depressed mentally. She was given nicotinic acid by force in doses of 1,100 mg. during the first twenty-four hours and 500 mg. daily thereafter. After twenty-four hours of treatment, definite improvement of the mucous membranes was noted, and by the third day they appeared normal. On the fourth day she was less depressed mentally and less confused and willingly took food and medication. On the fifth day she talked freely, conversed with other patients, became interested in her condition and apparently had insight for the first time into her illness. She volunteered that she had been "crazy in her head" and that she did not know anything about coming to the hospital. She stated that she had thought that snakes, worms and knives were crawling over her but that she now realized that these sensations were unreal. Her appetite and general condition improved and she was discharged from the hospital in good condition.

CASE 2.—E. B., a Negress aged 49, was admitted to the hospital because of severe pellagra. The family history and the past history are irrelevant.

For almost a year the patient had eaten chiefly sweet and greasy foods and occasionally some green vegetables. About three months prior to admission extreme anorexia developed and she lost weight. She felt weak, experienced abdominal discomfort and noticed alternating periods of diarrhea and of constipation. She often had involuntary defecation and urination, became unable to sleep, was very nervous and, according to her family, had severe personality changes. A severe "hurting in the stomach and breaking out of the skin" developed one month before admission. During the last two weeks before coming to the hospital she was unable to get out of bed and refused all food. She was unable to sleep, her memory was impaired and she was disoriented entirely as to time and place. She had hallucinations characterized by the seeing of insects and snakes, and thought that people were trying to poison her; she heard groups of people discussing attempts to kill her. She had many delusions of persecution.

The patient was emaciated, confused and restless, and she required restraint. The mucous membranes of the tongue, mouth, throat, gums and vagina were red, and small areas of ulceration were present. The skin in general was dry, rough and loose. She had sandpaper-like roughness over the nose and forehead and pellagrous dermatitis over the neck, bony prominences, dorsum of the hands, wrists, forearms, feet, ankles and perineum. Many of the lesions were thickened and pigmented, excoriated and macerated. A decubitus ulcer was present over the sacrum. All tendon reflexes were present and hyperactive. Her mental status was one of confusion, apprehension, restlessness and disorientation as to time and place. She had delusional ideas of persecution and visual and auditory hallucinations.

Laboratory work gave essentially normal results except that the blood hemoglobin content was 70 per cent and the red blood cell count 3,700,000.

Course in the Hospital.—During the first ten days, while the patient was taking a basic diet and no medication, except 3 ounces (90 Gm.) of brewers' yeast on the first day, her condition remained stationary. There was slight healing of the skin during this period. During the next twelve days she was offered but took little of a high caloric, high vitamin diet, and each day she received four injections of 10 cc. of liver extract. During this period there was progressive healing of the dermal lesions and the tongue became normal. She took little food, and there was no essential change in the mental condition. Involuntary defecation and urination continued. On the twenty-second day in the hospital the administration of nicotinic acid was begun in doses of 100 mg. five times a day. Three days later she was mentally clear and cheerful, talked freely and had no delusions or hallucinations. She began to eat more. On the fourth day she ate all the food on her tray and on the fifth day asked for and ate a second regular hospital tray of food. One week after the treatment by means of nicotinic acid she became inquisitive about being brought to the hospital and about members of her family. She was discharged from the hospital in good condition.

THE EFFECT OF NICOTINIC ACID ON SUBCLINICAL PELLAGRA

Having found that nicotinic acid is effective in treating pellagra and in preventing recurrences under hospital conditions,[6] we thought it worth while to study its effect on adult pellagrins living at home without change in environment or activities. One hundred and ninety-nine such pellagrins who were subject to one or two recurrences of the disease each year were selected for study.

Within one to three days after treatment with nicotinic acid was instituted, nearly all the patients volunteered that they felt much better and that dizziness, depression, burning sensations, confusion and "upset head" had disappeared. Thirty of the patients who had suffered from chronic constipation stated of their own accord that their bowel movements returned to normal after they took nicotinic acid. One patient whose pellagra had been complicated by mucous colitis had normal stools for the first time in three years.

After continuing to take the prescribed amount for several weeks, however, many of the patients stated

5. Spies, T. D., and Aring, C. D.: The Effect of Vitamin B₁ on the Peripheral Neuritis of Pellagra, J. A. M. A. **110**: 1081 (April 2) 1938.

6. Grant, J. M.; Zschiesche, Elisabeth, and Spies, T. D.: The Effect of Nicotinic Acid on Pellagrins Maintained on a Pellagra-Producing Diet, Lancet **1**: 939 (April 23) 1938.

that they did not feel especially well. The dose of nicotinic acid was increased in such instances and this was invariably followed by a second improvement in sense of well being and increase in energy. In a group of control patients these periods of improvement have not occurred. These studies are still in progress and will be reported later,[7] but we can say that the pellagrins in the test group, as contrasted with those in the control group, have been benefited and that nicotinic acid is valuable in preventing recurrences of pellagra. It is of interest that in a number of cases evidence of vitamin B_1 deficiency developed while the patient was taking large quantities of nicotinic acid.

Throughout all the studies we observed that the response of the individual pellagrin to a given amount of nicotinic acid, or to one of its salts, is extremely variable. For example, we have noticed healing after the administration of as little as 40 mg. of nicotinic acid daily by mouth in one person, while in other persons receiving the same amount the disease became worse. We have given a single oral dose of 1 Gm., which produced transient flushing, reddening and burning of the skin, followed by remission of the pellagrous lesions. We do not, however, recommend such large doses, as the subsequent symptoms are unpleasant and the results may prove to be deleterious in effect. Two patients who were restricted to a basal diet were given nicotinic acid intravenously because of their unwillingness to take the material orally. One of them showed improvement of the pellagrous glossitis and stomatitis and cessation of diarrhea after only 10 mg. had been injected daily for four days, while the other showed a prompt cessation of nausea and vomiting and healing of pellagrous glossitis after the daily administration of 20 mg. for the same length of time. Both of these patients were in the basal state, ate the full diet and had only mild lesions of pellagra. We have given single intravenous doses of 25 mg. in a 1:1,000 solution within two to three minutes without harmful effects, but we do not recommend that this dose of the material be administered so rapidly.

Although the symptoms of all pellagrins receiving nicotinic acid improved, irrespective of whether the patient was restricted to water, to water and dextrose or to a basic diet, we observed that the patients responded better if they ate large amounts of a well balanced diet, were kept at rest and had no coexisting disease.

EFFECTS OF NICOTINIC ACID ON 100 ADULTS WITHOUT PELLAGRA

In view of the fact that pellagrins in relapse and with subclinical pellagra often had flushing, burning and itching of the skin and other unpleasant symptoms after the administration of large amounts of nicotinic acid or its salts, it seemed essential to study this reaction in some detail in normal persons in order to ascertain whether the pellagrin had a peculiar reaction to these chemical substances.

Cutaneous Response.—The oral administration of large quantities of nicotinic acid is followed by flushing, burning, itching and an increased sensation of local heat in the skin. This finding apparently can be produced in all persons, although the amount required to produce it is extremely variable at different times in the same person and from one person to another. A patient with pellagra seems less likely to have this type of reaction. It was produced in about 5 per cent of the group when an oral dose as small as 50 mg. in aqueous solution was given with the stomach empty, and it was produced in about 50 per cent when 100 mg. was given. It was present to some degree in every person receiving as much as 500 mg. orally, and the majority of the subjects had a reaction when 200 mg. was given. By detailed study of the changes in cutaneous temperature, we found that the increase was most marked over the ears, face and neck, less pronounced over the trunk and least pronounced over the extremities. In some cases the hands and feet showed no change, and occasionally they showed a decrease in temperature of from 1 to 2 degrees C. (1.8 or 3.6 degrees F.). Actual measurement of the changes in temperature by means of a thermocouple and a room with constant temperature (20 C.) revealed an average increase of from 1.5 to 2 degrees C. (2.7 to 3.6 degrees F.) over the face and neck (chart 1) and an increase of from 0.5 to 1 degree C. (0.9 to 1.8 degree F.) over the trunk. This elevation in temperature was most pronounced in areas where the other objective and subjective changes were present. The distribution of the changes followed the normal pattern of the cutaneous temperature, the temperature being greatest where the skin normally is warmest and

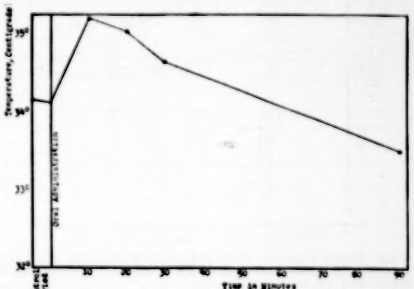

Fig. 1.—Changes in the temperature of the face (average of ten areas) of a normal man after oral administration of 100 mg. of nicotinic acid.

decreasing as it approached the colder periphery. The redness and flushing were extreme in the ears and striking over the malar bones, face and neck; they frequently assumed a blotchy and irregular distribution over the trunk and tended to decrease over the abdomen and the extremities. Occasionally, circumoral pallor was noted. In patients with the extreme degree of flushing there was sometimes slight elevation of the red areas. In some instances we noted flushing accentuated in the perineal and axillary regions, associated with a sense of increased warmth or itching. No change was noted in the tongue or mucous membranes. In a small percentage of the cases there was sweating, especially of the face and axillas. Usually the skin appeared more shiny after the flushing reaction.

Similar effects were observed following the intravenous injection of from 5 to 25 mg. of nicotinic acid in physiologic solution of sodium chloride. Variation in the p_H from 3.4 to more than 7 did not change these effects.

Since the flushing, nausea, vomiting and abdominal cramps which sometimes follow the administration of large doses of nicotinic acid suggested a parasympathetic-like action similar to that produced by the

7. Spies, T. D.; McLester, J. B.; Stone, R. E., and Grant, J. M.: Unpublished observations.

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acetylcholine group of chemicals, it seemed advisable to make a comparative test for nicotinic acid and for acetylcholine. Chart 2 shows that the reactions produced by intra-arterial injection of acetylcholine and those produced by nicotinic acid are not identical. The nicotinic acid continues to give some general effect, demonstrating that it is not destroyed entirely or inactivated in the capillaries as is acetylcholine.[8] In both cases there was an increase in cutaneous temperature of from 1 to 2 degrees C. in the leg which received the injection. Nicotinic acid has caused a reaction like that to histamine when intracutaneous injections were made. It was noted, however, that the wheals differed considerably from the typical histamine wheal. The local reactions from nicotinic acid occur less frequently, are less marked and are of shorter duration than are those from histamine. The associated pruritus is less severe than that caused by comparable amounts of histamine.

Cardiovascular and Respiratory Reactions.—No constant deviation in the pulse, blood pressure or respirations occurred after oral or intravenous administration

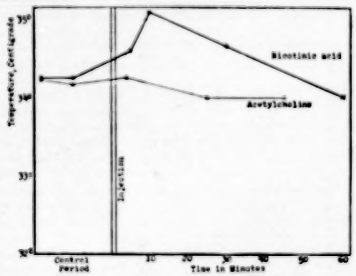

Fig. 2.—Temperature of the face (average of ten areas) of a normal man before and after injection of 10 mg. of nicotinic acid and 30 mg. of acetylcholine into the femoral artery.

of the drug under the conditions of this study. Rarely after intravenous injection of from 10 to 20 mg. of a 1:1,000 solution, given within a period of from one to three minutes, there was an increase in pulse rate of from five to ten beats per minute. This was not produced by similar injections of physiologic solution of sodium chloride. We have seen occasionally a transient increase in the rate and depth of respiration and in one patient true angor animi. Preliminary investigations with seven normal subjects revealed that there is no uniform variation in oxygen consumption during the period when the flushing is marked, but in two subjects there was some increase. We found no changes in the complexes in the electrocardiograms of four normal males made during or after the intravenous or oral administration of nicotinic acid in doses which produced the flushing reaction. Some patients have complained of dizziness after the oral administration of large doses.

Effects on the Gastrointestinal Tract.—Several subjects have complained of nausea and cramps in the epigastrium after the administration of single doses of nicotinic acid ranging from 300 to 1,500 mg. given orally and from 10 to 25 mg. given intravenously. Two had vomiting; cramps and belching occurred in nine after the intravenous injection but in only four after the oral administration. In almost every instance the cramps occurred when the material was administered while the stomach was empty. Eight subjects were examined under the fluoroscope with barium sulfate in the stomach, before, during and after intravenous administration of the substance. No change could be demonstrated in four, but the other four had a definite increase in the depth of the peristaltic contraction rings of the stomach. Two of these four had severe cramps associated with generalized increase in gastric tonus, considerable decrease in the size of the stomach and complete cessation of all gastric movement for a minute. After resumption of gastric activity, the contraction waves rose much higher toward the cardiac end and were much deeper than they were prior to the administration of the drug. The subcutaneous injection of 5 mg. of nicotinic acid was followed in three patients by increased secretion of gastric hydrochloric acid, in one patient even when fasting anacidity was present. The magnitude of change, however, was not as large as that produced by 1 mg. of histamine in the same patient. Similar observations were made by V. P. Sydenstricker.[9]

Other Observations.—Because of the clearcut action of nicotinic acid on gastrointestinal function in pellagrins and in normal persons, we have made preliminary studies on a group of patients with constipation but without pellagra or organic gastrointestinal disease. In some instances there has been a striking return of bowel function to normal. In others, there has been no change.

In seven cases of radiation sickness we have used nicotinic acid orally in divided doses totaling from 200 to 1,000 mg. daily and have noted prompt cessation of the nausea, vomiting, anorexia and headache. In five of the seven cases the amount of porphyrin in the urine, which was abnormally large, returned to normal. Communications from V. P. Sydenstricker and John W. Spies indicated that they had observed similar results.

Since in dogs part of the nicotinic acid excreted in the urine is in the form of a conjugate with aminoacetic acid (glycine), nicotinuric acid,[1] we have made a study of the reactions of flushing and temperature in normal persons who were given 30 Gm. of aminoacetic acid one hour before they were given 500 mg. of nicotinic acid orally. In six cases studied to date we found that the elevation of temperature was delayed and decreased when compared with the elevation in control tests, in which aminoacetic acid was not given. Because we have found that the quantitative estimation of change in temperature after the administration of nicotinic acid varies considerably in a given person under standard conditions with the same dose, we have not yet enough data to be certain that this effect with glycine was not fortuitous.

Excretion of Nicotinic Acid of Pellagrins in Relapse, of Persons with Subclinical Pellagra and of Normal Adults.—Since some persons given the drug complained of increased frequency of urination after taking nicotinic acid, five subjects were given a constant fluid intake, with the output measured, for a week and were then given a total of 750 mg. of the drug orally in five equal, hourly doses. The urinary output was measured, and it was found that there was a slight increase during the period immediately following ingestion of the drug but

8. Ellis, L. B., and Weiss, Soma: A Study of the Cardiovascular Responses in Man to the Intravenous and Intra-Arterial Injection of Acetylcholine, J. Pharmacol. & Exper. Therap. **44**: 235 (Feb.) 1932.

9. Sydenstricker, V. P.: Personal communication to the authors.

that there was no significant change in the twenty-four hour output for the control period and for the subsequent three days. It was found also that there was no significant change in the carbon dioxide combining-power of the blood after administration of this quantity of nicotinic acid. When doses of from 10 to 25 mg. of nicotinic acid were given intravenously, the substance appeared in increased amounts in the urine within the first hour. In some cases the content would not return to the preinjection level for one or more hours. When smaller doses, 10 mg. or less, were given, the nicotinic acid returned to the control level within one hour. Oral doses of 20 mg. or more usually did not produce a maximal rise in the content in the urine until the second, third or fourth hours.

Comparative study of several hundred determinations of nicotinic acid in the urine suggests a tremendous variation from time to time in the individual person and from person to person, but there does seem to be some influence on the amount excreted, depending on whether a person has a normal supply in his diet, on the amount of the drug given and on the mode of administration. Also, the evidence suggests that the body of a pellagrin in relapse retains more of the drug when it is administered than does a normal person of the same size, and that the flushing reaction is less frequent and less intense in the severely ill pellagrin than in the normal person given the same amount.

COMMENT

Study on the response to the nicotinic acid group of chemicals in the seventy-three pellagrins in relapse and in the persons with subclinical pellagra suggest that these substances are essential for the proper nourishment of the cells. Analysis of the case histories of several hundred pellagrins in relapse shows that three factors may operate to produce a deficiency of these substances in human beings: 1. The intake of foods containing nicotinic acid may be inadequate. 2. The absorption of nicotinic acid may be below normal because of some altered gastrointestinal function. 3. The intake may be sufficient and absorption normal for the average person, but there may be an increased demand because of excessive exercise, insomnia, hyperthyroidism or other conditions which increase the body's need.

The role of nicotinic acid in the nutrition of the body is not clear. It appears however that, if the body lacks adequate amounts of this substance or substances that act similarly, ill health occurs and pellagra eventually may develop. Studies on nicotinic acid have been so meager that its precise effect on the cells of the body is not known. The present observations, however, show that its lack leads to cellular alteration in the alimentary tract, skin and other systems, and to alteration in porphyrin metabolism. That nicotinic acid has a fundamental role in porphyrin metabolism is suggested by the fact that not only the porphyrinuria of pellagra but also that of other diseases has been decreased after the administration of nicotinic acid.[10] The observations that two normal adults ingesting a diet deficient in nicotinic acid showed increased porphyrinuria within a week and that the increased porphyrinuria disappeared after the administration of this substance also indicate a close interrelationship between nicotinic acid and porphyrins.[11] Certain observations suggest that, in addition to playing an apparently fundamental part in porphyrin metabolism, nicotinic acid is necessary for the normal functioning of the gastrointestinal tract.

For some time investigators have thought that pellagra may be due to a deficiency of more than one essential nutritional substance. Aring and Spies [8] recently showed that nicotinic acid will not relieve the pain and numbness caused by the peripheral neuritis of pellagra, whereas these symptoms can be relieved promptly by the administration of thiamin chloride. Conversely, these investigators have shown that the mucous membrane lesions of pellagra, which are cured by nicotinic acid, are not affected specifically by thiamin.

The present study reveals that the mild mental symptoms, consisting of confusion, dizziness, loss of memory and depression, are promptly benefited by nicotinic acid and that even the severe psychoses often associated with pellagra will be relieved by the administration of this substance. One patient who showed no clinical evidence of pellagra but who had had diarrhea for about twenty-five years and who, during the past few months, had acquired a severe psychosis in which she became disoriented as to time, place and person, responded rapidly and dramatically to the administration of nicotinic acid. Studies now being carried out on the prevention of recurrences of pellagra by means of nicotinic acid show to date that recurrences are at least delayed by the administration of this substance.

Despite the evidence presented in this paper showing the beneficial effects of nicotinic acid in the treatment of pellagra, we are convinced that all patients with pellagra should be given sufficient rest, adequate amounts of a well balanced diet, appropriate treatment for coexistent diseases and palliative therapy when necessary.

SUMMARY AND CONCLUSIONS

1. The present report confirms the previous observations of Spies, Cooper and Blankenhorn that after adequate doses of nicotinic acid, nicotinic acid amide or sodium nicotinate the pellagrous glossitis, stomatitis, vaginitis, urethritis and proctitis are healed; that the early erythematous lesions of pellagra are blanched, and that the porphyrin content of the urine returns to normal. In addition it has been found that the diethyl amide of nicotinic acid (coramine) has somewhat similar therapeutic properties, whereas trigonelline, in comparable doses, is inactive.

2. The present studies show that the early and late mental symptoms of pellagra in relapse and of subclinical pellagra are benefited dramatically by the administration of nicotinic acid. These results strongly suggest that nicotinic acid or closely related substances are essential to the integrity of the cells of the body, and that a sufficiently prolonged deficiency of such substances results in ill health and eventually in pellagra. To us it seems that pellagra should be considered as a reaction of the body to lack of essential nutritional substances and not just as a dermatitis, and that nicotinic acid is one of those essential substances and is necessary for the normal functioning of the gastrointestinal tract, the skin, the nervous system and probably other systems. It is of interest that the pellagrins who had associated Vincent's infection, mucous colitis, constipation or diarrhea were relieved of these conditions after the ingestion of nicotinic acid. In a group of patients

10. Spies, T. D.; Gross, E. S., and Sasaki, Y.: Effect of Yeast and Nicotinic Acid on Porphyrinuria, Proc. Soc. Exper. Biol. & Med. 38: 178, 1938.

11. Spies, T. D.: Unpublished observations.

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without pellagra but with constipation, bowel function frequently resumed a normal status after oral doses of nicotinic acid. In some cases, however, there was no improvement.

3. Relapse in 199 patients with subclinical pellagra (who had previously had one or two recurrences each year) has been prevented through the "pellagra season" by daily oral doses of nicotinic acid. In some of these patients vitamin B_1 deficiency developed.

4. A study of the children in several hundred "pellagra families" indicated that a slowly progressing deficiency in the antipellagra factor commonly exists in these children but that definite diagnostic evidence of pellagra develops later. After the administration of nicotinic acid or one of its compounds they experienced an increased sense of well being and disappearance of symptoms. Pellagra in thirty-six of the children having the manifestations of acute pellagra responded to the oral administration of ten doses of 10 mg. each per day of nicotinic acid in the same manner as in adults.

5. The oral method of administration of nicotinic acid, nicotinic acid amide or sodium nicotinate is recommended except for patients unable to ingest the material by this route. The giving of nicotinic acid in oral doses of 200 mg. or in intravenous doses of 10 mg. within one minute nearly always produces dilatation of the small vessels of the skin of the face and the upper part of the trunk. This is characterized by increased temperature, flushing, burning and itching sensations. The sebaceous glands take on increased activity. Gastrointestinal motility may be increased, particularly if the drug is administered when the patient's stomach is empty. The pulse, blood pressure and respirations and the electrocardiogram are not regularly changed. The drug has a weak reaction like that to histamine and is not destroyed by passage through the capillaries, as is acetylcholine.

6. Observations on these pellagrins and on normal persons indicate that the requirement for nicotinic acid, nicotinic acid amide, sodium nicotinate or the diethyl amide of nicotinic acid is increased by infection, physical exercise and elevation of temperature. The dose of nicotinic acid and of these compounds required for any given pellagrin is extremely variable, but 500 mg. a day in divided doses is usually effective. Smaller doses, however, often produce dramatic relief of symptoms. In some cases twice this amount seemed more effective. It is recommended that all patients in relapse and those having subclinical pellagra be given a well balanced diet, ample rest in bed and effective treatment for any coexisting disease even when nicotinic acid is used as a supplement.

ABSTRACT OF DISCUSSION

DR. THOMAS T. MACKIE, New York: The authors have made a most important contribution in their confirmation of the amazing therapeutic value of nicotinic acid in the treatment of pellagra. There are three points that I should like to discuss. I have been interested in secondary deficiency disease for years. The lesions of the tongue described as the early indication of pellagra do not differ from similar lesions seen in persons in New York City who are suffering from mixed deficiency states and in whom the characteristic lesions of the skin never develop. In the second place, there is the matter of definition: What are the criteria which justify the diagnosis of pellagra? Like dropsical sprue and nondropsical sprue, pellagra is a clinical entity, and by definition it is associated with the appearance of the tongue and buccal mucous membrane, symmetrically disposed dermatitis and lesions and disturbances of the central nervous system. It is important for the time being to hold strictly to these criteria. It is interesting, in looking back through the recent developments of medicine, to see how some new bit of knowledge is applied by different people in different parts of the world at almost the same time. The use of nicotinic acid in the treatment of pellagra is no exception to this. Elvin and his associates used nicotinic acid in the control of canine blacktongue. In November 1937 Foots and his associates first reported the use of this preparation for human pellagra. In December 1937 Smith and Ruffin reported the use of nicotinic acid in the treatment of a human being with pellagra. Finally, Dr. Spies and his associates brought out their first and exceedingly important contribution in February of this year. Another point I should like to make is the necessity for caution in the interpretation of the value of nicotinic acid for so-called pellagra, at least as it is seen in the North, where it occurs almost invariably as the result of alcoholism or some advanced and serious chronic disease. In that respect it differs materially from the true endemic pellagra of the South. It seems not unreasonable, therefore, to anticipate that the therapeutic value of nicotinic acid in the hands of practitioners may appear to be less effective in the North than in the South. It has been my experience that the drug should be used with caution in treating patients presenting the lesion of the tongue which the authors described but not the lesions of the skin and that the drug is not as effective as it appears to be for the true endemic pellagra.

DR. JULIAN M. RUFFIN, Durham, N. C.: For the critical evaluation of the potency of any therapy, definite criteria must be established. With pernicious anemia, for example, one uses the rise in the reticulocytes. In pellagra there is no one symptom or sign the subsidence of which can be taken as conclusive evidence of remission. It is well recognized that the dermatitis may fade spontaneously when the patient is protected from the direct rays of the sun and that the patient may actually die after the dermatitis has disappeared. Therefore the subsidence of the dermatitis cannot be taken as satisfactory evidence of remission. Glossitis is a common symptom in pellagra. The authors apparently have accepted subsidence of the glossitis within a few days as evidence of the potency of the drug used. According to my experience this conclusion is not justified. Spontaneous subsidence of the glossitis occurred in twenty-six of seventy-two cases of pellagra (36 per cent). Furthermore, the glossitis recurred in sixteen of these cases after exposure of an arm or leg to the direct sunshine. I feel, therefore, that subsidence of the glossitis per se cannot be taken as conclusive evidence of remission. Improvement in the patient's general well-being, associated with subsidence of the dermatitis, glossitis, diarrhea and dementia, if present, and absence of relapse after exposure to sunshine constitute the only conclusive evidence of remission. However, since many other deficiencies result in a picture similar to that seen in pellagra, I feel it extremely unwise to make the diagnosis of pellagra or even of subclinical pellagra in the absence of a characteristic rash or a reliable history of one. I have found that small doses of nicotinic acid (1.5 mg. per kilogram of body weight, from 70 to 100 mg. daily) result in prompt recovery and are as effective as doses ten times as large in the average case of acute pellagra or for blacktongue. Large doses of nicotinic acid, 1 Gm. daily, invariably result in unpleasant sensations. Ten students were given 1 Gm. a day, divided into four doses. In every case flushing of the face and neck occurred. In two cases nausea and vomiting developed. One student was quite ill for twenty-four hours. In two cases marked cyanosis of the finger nails developed and disappeared at the end of twenty-four hours. Furthermore, Dr. Chen has reported that the daily administration of 2 Gm. of nicotinic acid to two dogs over a period of twenty days resulted in the death of both dogs. It should be emphasized, therefore, that the drug is definitely toxic, and the indiscriminate use of large doses is to be deplored.

DR. MOHAMMED ABDO ABBASY, Cairo, Egypt: It is a great privilege to be allowed to speak before such a learned gathering. I feel highly honored and thankful for the circumstances that brought me to San Francisco during this time. Egypt is concerned with the question of pellagra and its treatment with nicotinic acid. The work published by Dr. Harris in England,

Dec. 18, 1937, was in part done in Egypt by Professor Ali Hassan, and this work was arranged by the Nutritional Laboratory in Cambridge when I was working there with Dr. Harris. I am inclined to agree with Dr. Spies in considering pellagra a multiple deficiency disease. It is reasonable that the victims of pellagra miss many things in their diet other than nicotinic acid or one of its compounds. The fact that the peripheral neuritis responds only to a supplement of vitamin B_1 and that pellagrins responded to nicotinic acid better when they were receiving a well balanced diet is in favor of this view. It remains only for future investigation to disclose whether more substances are involved in pellagra and if so their role in the prevention and cure of the disease. The history of pellagra in Egypt is linked with the introduction of maize into the country. The first cases recorded appeared four or five years after the introduction of this crop. In Lower Egypt, where more maize is grown and consumed by the peasants than in Upper Egypt, owing to the different systems of irrigation in the two parts of the country, pellagra is more prevalent. Pellagra in Egypt is in the nature more of a secondary deficiency disease than of a primary one. Genuine pellagra does occur because of a lack in the diet of the factor or factors concerned. In a greater percentage of cases, however, it is due to lack of absorption of the factors concerned, although they are present in the diet, because of severe gastrointestinal disturbances caused by intestinal parasites, mainly Schistosomum mansoni and Ancylostoma. Members of one family, who are sharing their food and eating nearly the same quantities of it, are some of them victims of pellagra while the others are not. Those who are the victims are nearly always found to be heavily infested with intestinal parasites, and once they are freed from these parasites the pellagra is cured without any change in the diet. In Lower Egypt, where the perennial system of irrigation operates (and this system exposes the farmers much more to infection, with Schistosomum mansoni especially), schistosomiasis is more prevalent than in Upper Egypt, where the basin system of irrigation is generally adopted, and, as expected, pellagra also is more prevalent in Lower Egypt. Pellagra in Egypt is not confined to the poorer classes of the community as it is in the United States; it also has victims among the richer classes who are subject to the evils of these intestinal parasites.

DR. J. N. BAKER, Montgomery, Ala.: It was an Alabama physician, Dr. George H. Searcy, who first reported pellagra in endemic forms. His report, made in 1907, contributed notably to the study of the disease and had the highly beneficial effect of making not only the medical profession but the general public pellagra conscious. It told of the existence since 1901 of formerly unrecognized pellagra in the Mount Vernon (Ala.) insane asylum. Pellagra was responsible for 306 deaths in Alabama in 1936, divided almost equally between the white and the Negro races; a rather significant fact, since the white population outnumbers the Negro almost two to one. For the population as a whole the death rate for pellagra was 10.8 per hundred thousand. The rate for white people was 8.2 and for Negroes 15.4. A deficiency disease like pellagra can be expected to be more prevalent and more fatal in communities where standards of living are low, and the study of pellagra which has been mentioned emphasized this fact so far as this state is concerned. Some time ago the Tennessee Valley Authority made public the results of a study of spendable per capita income in several Southeastern states and also of per capita spendable income by counties within certain states. The statisticians found that the per capita spendable income of Alabama as a whole was $214, which may appear low to persons from wealthy industrial states. Four of the thirteen counties having a death rate for pellagra of 15 per hundred thousand of population or higher were shown to have spendable incomes of less than $100 a year. It is a medical axiom that death rates, both the general death rate and the rates for specific diseases, reflect at least in part the adequacy or inadequacy of medical care. Thus one would expect that the counties having an unusually high death rate for pellagra would have inadequate medical service. This is true so far as Alabama is concerned. Of the thirteen counties having an abnormally high death rate for pellagra, all but four actually have fewer physicians than they had a quarter of a century ago. These four apparent exceptions to the rule are the counties already mentioned as having an unusually high per capita spendable income. Study has thus given added strength to the assumption that living standards, medical care and other physical factors play a vitally important part in the killing power of pellagra and that, contrary to a widely held belief, the death rate does not go up as a consequence of prosperity or come down as a consequence of economic distress.

DR. JAMES E. PAULLIN, Atlanta, Ga.: Since 1907 I have been interested in pellagra, for at that time there was a tremendous amount of it in the South. In attempts to confirm the existing theory as to the etiologic factor, it was soon found that maize had nothing to do with its prevalence. Since that time various efforts have been made to diagnose early pellagra and to institute proper treatment. I agree with the authors that dermatitis is not always necessary for a diagnosis of pellagra. Patients without any other evidence of pellagra may have the dermatitis, and there may be innumerable gastrointestinal and nervous symptoms that establish a diagnosis of pellagra without dermatitis and without its production on exposure to the sun. While the diagnosis may be a question for debate, there isn't any question about the beneficial results of nicotinic acid in patients who have pellagra without extensive dermatitis. The authors have not painted the dramatic improvement which will occur within twenty-four hours in a patient who is part of the time abed and the remainder of the time on a bedpan and has a most intense, ulcerative, inflamed lesion of the mucous membranes of the mouth. In from twenty-four to forty-eight hours after the administration of nicotinic acid he is able to occupy the bed in comfort and is able to take nourishment and retain it; such a transformation is rather remarkable. Nicotinic acid does not produce rapid disappearance of the dermatitis, but with the discovery that this very useful drug overcomes the clinical syndrome this matters not so very much. The drug is a wonderful contribution to clinical medicine and to the health and comfort of many sufferers.

DR. A. J. CARLSON, Chicago: I have followed the problem of pellagra with a great deal of interest since the days of Goldberger. I want to ask one question and speak one word of caution. I am informed that in the Carolinas the Red Cross has for years supplied poor families with an abundance of yeast and that despite taking it (or presumably taking it) the families have periodic ups and downs with so-called pellagra. I wonder whether the authors have any explanation of this, assuming that the information is correct. This leads me to another point, the point of caution, hinted at by several of the discussers, particularly Dr. Abbasy. If pellagra is a deficiency disease and if nicotinic acid really cures any of the symptoms, nicotinic acid must be a food. Also one should not be too enthusiastic, in view of what is known regarding the deficiency in all other aspects of the diet of the people affected. Nicotinic acid, while it may relieve and cure suddenly some of the symptoms of pellagra, can probably not overcome a general dietary deficiency. So I think that in the long run nicotinic acid will not relieve either the medical profession or society of the necessity of looking for a more nearly optimum diet for the great portion of the population affected. It would be curious indeed if there was only one factor, namely nicotinic acid, in the pellagra complex. The physician may be deceiving himself if he thinks that the patient is all right when he has recovered from the acute stage with the aid of nicotinic acid. That is my word of caution. I do not think that Dr. Baker intended to say that the medical profession is responsible for pellagra in Alabama.

DR. J. N. BAKER: I think that the problem is one of economics.

DR. A. J. CARLSON: Not entirely. It may be a case of economics for people who live in the city and so have to buy every item of food. It is not a mere problem of economics in the case of people who have an acre of land, but not the sense to raise food on it.

DR. P. J. HANZLIK, San Francisco: I was glad to hear the discussion by Dr. Ruffin because it was the first time that

I have heard some caution expressed about the use of this agent. Pharmacologists know that a therapeutically useful agent is generally also toxic. Although nicotinic acid is far removed chemically from nicotine, the patients reacted with effects on the circulation, nausea and vomiting and other symptoms. This suggests that nicotinic acid shares some of the actions of nicotine. Apparently it is going to be used repeatedly, and it is a symptomatic remedy, at least at present. Whether it is a drug or something else makes no difference. It is being used extensively, however, and another word of caution, in addition to that of Dr. Carlson, therefore seems to be in order. I should like to suggest studies of the action of this agent over long periods, small and large doses being used and evidence of chronic intoxication being sought. What will the drug do under these conditions to the blood, to the viscera and so on? When nicotine is used in this way over long periods it is injurious. I offer the suggestion that nicotinic acid be used more cautiously than it appears to be, especially in view of the large doses that are employed.

Dr. William DeKleine, Washington, D. C.: Dr. Carlson mentioned the work of the American Red Cross. In the period from 1927 to 1934 the Red Cross distributed over a half million pounds of powdered yeast. The highest aggregate death rate for pellagra ever recorded in this country in the thirteen Southern states where the disease prevails most extensively occurred in 1928. After the distribution of a half million pounds of powdered yeast and the introduction of gardening the rate was gradually reduced until 1935, when it was 60 per cent below the 1928 rate. Dr. Baker said that pellagra is largely an economic problem. It is just that. The tenant farmers in the South buy their food at the corner grocery or commissary. They do not grow it on the farm. Gardening has until recently been a lost art on the cotton plantations of the South. It is coming back slowly, now that plantation owners and tenants have learned its value. The food purchased in the stores is the cheapest kind—fat meat, meal, molasses and so on—food that does not contain the pellagra-preventive factor. That is why the death rate for pellagra is so high. Until it is made possible for people to get the food they need pellagra will not disappear. Is it the opinion of Dr. Spies and his co-workers that nicotinic acid is the same as the pellagra-preventive factor of Goldberger? Judging from what Dr. Ruffin has said there is some doubt. In view of the importance of pure yeast as a control measure, is nicotinic acid equally effective and can it take the place of yeast, or must further experimentation be awaited? I am inclined to think that physicians should wait until they know more about its effects. Powdered yeast has not been distributed in recent years. I am wondering now whether it should again be distributed to people who cannot buy it or whether nicotinic acid should be substituted. My own experience would lead me to believe that the use of pure yeast is still the most effective control measure.

Dr. Tom Douglas Spies, Cincinnati: I am overwhelmed with the pertinent discussion of this paper. Nicotinic acid is a constituent of food, and antipellagric foods such as yeast, wheat germ and liver are rich in nicotinic acid; foods such as corn meal, corn syrup and fat meat, which predispose to pellagra, contain little if any nicotinic acid. Contrary to Dr. Ruffin's impression, the dose of nicotinic acid prescribed for the treatment of pellagra is necessarily inconstant, because of the variation in the manifestations and severity of the disease. If Dr. Ruffin cured all of his pellagrins with only 70 mg. of nicotinic acid, given orally, he must have been dealing with mild forms. When he does preventive work with pellagrins he will note that the curative dose for one is not sufficient to prevent the development of the disease in another. To prescribe too small a dose is to run a risk and to lengthen unnecessarily the convalescence; to withhold nicotinic acid from severely ill pellagrins is to deprive them of the best single therapeutic drug now known. In regard to Dr. Mackie's point that the requirement for nicotinic acid seems greater in the alcoholic patient than in the patient with endemic pellagra, we found that the response to adequate amounts of nicotinic acid was uniformly dramatic in the series of cases, including cases of both endemic and "alcoholic" types, studied at the Cincinnati General Hospital during September 1937. In reporting these observations before the Central Society for Clinical Research in Chicago, Nov. 5, 1937, we stated that nicotinic acid was an antipellagric factor and was life saving for moribund patients. Subsequent publications have confirmed our observations. We recommend that all patients with pellagra be given a well balanced diet, but if such a diet is not obtainable or if the patient is unable to ingest it, nicotinic acid should be used as a specific therapeutic agent. Although the minimal curative dose has not yet been determined, we have found 500 mg., in doses of 50 mg. each, given over a period of twenty-four hours, a safe, effective and cheap remedy. Concerning the effect of sunlight, no one at present is in a position to state anything with absolute certainty. Sunlight may precipitate certain lesions, but it does not account for all and is not of nearly so much importance as is improper nutrition. We are just as much interested in why in the majority of cases reported by Dr. Ruffin there was no effect from exposure to sunlight as we are in the cases in which there was such an effect, since in these cases, so far as Dr. Ruffin has described, there was the same environment, the same type of food was ingested and the pellagra was of similar severity.

HEARING AIDS FROM OTOLOGISTS' AUDIOGRAMS

AUSTIN A. HAYDEN, M.D.
CHICAGO

The first hearing aid man used, and he alone of all animals uses any artificial means to increase hearing, was the palm of his own hand. By cupping his auricle he focused and thereby intensified sound waves on the ear drum. To this day the hand is the most universal hearing aid.

Mechanical aids—tubes and trumpets of almost every kind, shape, curve, composition and construction, as

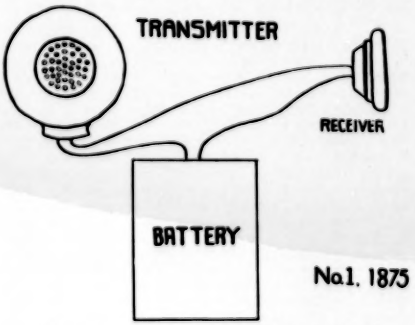

Fig. 1.—Alexander Graham Bell's original hearing aid.

well as fans, canes, chairs and innumerable other devices of the most ingenious design and elaborate construction—are mute evidence of an insatiable longing for better hearing.

A primitive transmitter, battery and receiver made up the original electric hearing aid that Alexander

Read before the Section on Laryngology, Otology and Rhinology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

As 95 per cent of the approximately 50,000 portable instruments sold in the United States in 1937 for approximately $5,000,000 were of the carbon transmitter type, only such instruments are considered in this paper.

Graham Bell constructed for his own mother. Although it amplified but little, it did focus sound waves more directly on the drum, was self retaining and had all the popular appeal of the electric gadget. From this, less than two years later, he perfected the first electric telephone.

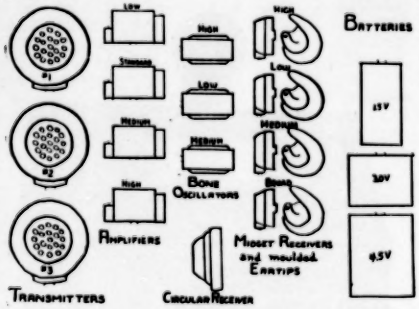

Fig. 2.—Present day portable transmitter type hearing aid parts.

Development of the electric hearing aid was at first slow indeed. Despite numerous splendid efforts for prevention and amelioration of hearing loss, including the extension of lip reading, the introduction of the fundamental tone audiometer by Edmund Prince Fowler and Harvey Fletcher and the foundation of the American Federation of Organizations for the Hard of Hearing[1] by Wendell C. Phillips, the deaf person remained the really "forgotten man," as far as hearing aids were concerned, until sixteen years ago. Half a century had passed since the first instrument had been fitted, and yet essentially one, and only one, type of electric hearing aid was available for general use. No important improvement had been made in Bell's original hook-up.

In 1922 Hugo Lieber introduced the midget air receiver with the shaped ear tip and two years later his "booster amplifying unit." In 1932 he brought out the first portable bone conduction hearing aid, and bone conduction was soon used in half the hearing aids manufactured.

Today the portable carbon transmitter type of hearing aid is a complex scientific instrument of considerable precision. In addition to the original telephone circular type, still occasionally used, four air receivers (high, low, medium and broad) and three bone receivers (high, low and medium) are now available. Three transmitters and four amplifiers with dry cell batteries of 1.5, 3 and 4.5 volts are in general use.

With the use of various combinations of the foregoing parts (eight receivers, three transmitters, four amplifiers, three batteries), 288 different hearing aids of this series can be assembled, each designed to correct a certain degree of hearing loss at a definite location in the hearing range. This is known as selective amplification. By use of the artificial ear, the fundamental tone audiometer[2] and the noise meter, the amplification of sound by the hearing aid can be determined and charted as to both frequency and intensity.[3] This is termed the instrument response, and from it base-fitting charts are made.

As most tones of ordinary conversation lie between the frequencies of 256 and 2,500 cycles per second and as hearing aids are built and human ears are intended primarily to hear the human voice, the attention of patient, otologist and manufacturer is rightly centered on this frequency range. If the instrument is to fit the patient and the patient is not compelled to fit the instrument, certain considerations are essential.

For many years otologists have satisfactorily measured hearing, generally by use of the voice (whisper and forced whisper, ordinary and loud conversation), tuning forks, tubes, bells, whistles, watches, acumeters, monochords and similar devices. The use of such devices has been and is now the practice of medicine. Authorized by law and qualified by special training and otologic experience, otologists are best qualified to make these clinical tests. Especially is this true when hearing aids are to be prescribed.

The old methods of testing hearing, however, do not supply the information needed for prescribing modern hearing aids. Today hearing must be measured in

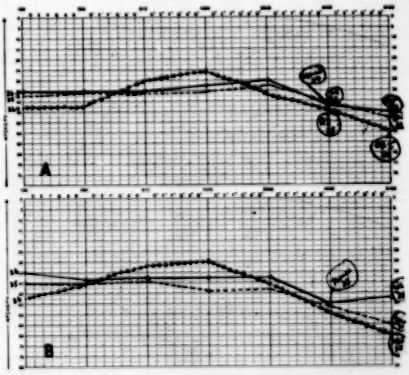

Fig. 3.—The results of comparative tests by air conduction at octave of Western Electric 6-A, Otologist Service and Maico Audiometers shown in composite audiograms of twenty-six moderately hard of hearing patients. *A* indicates the right ear and *B* the left ear. The patients were from the Chicago League for the Hard of Hearing, 64 East Lake Street, Gertrude Byrne executive secretary; the Ear, Nose and Throat Clinic, St. Joseph Hospital, and the author's office. Many of the patients who were tested at octave letter frequencies showed islands of hearing loss greater than 5 decibels at these intervals, emphasizing the necessity for continuous sweep measurements and the importance of letter calibration. In the right ear at 128 Maico reached the threshold in twenty-five of the twenty-six cases. At 4,096 Western Electric 6-A reached the threshold in twenty-two, Maico in twenty-four and Otologist Service in twenty-five. At 8,192 Maico reached the threshold in twenty-two and Otologist Service and Western Electric 6-A each in twenty-four. For the left ear the results were quite similar, as the chart shows. While these composite audiograms of this small number of cases, show some variation, establishment of a standard threshold level for calibration will probably correct much of this discrepancy. The Council on Physical Therapy of the American Medical Association will soon supply this.

terms of frequency (pitch) at octave and preferably at octave letter steps (especially for the most important range, from 512 to 2,500 cycles per second, the conver-

1. Now the American Society for the Hard of Hearing, Betty Wright, executive secretary, 1537 Thirty-Fifth Street N.W., Washington, D. C.

2. Howard A. Carter, secretary, Council on Physical Therapy of the American Medical Association, suggested the use of the word "fundamental" instead of "pure tone" to designate the vacuum tube audiometer.

3. Present models of four major manufacturers, Acousticon Coronation, Western Electric Ortho-technic, Radiocar Zephyr and the Sonotone Audicle, have all been tested and accepted by the Council on Physical Therapy of the American Medical Association. Much commendation is due these manufacturers for the improvements of the past six years.

sation range) and in terms of intensity (decibel loss). For this the fundamental tone audiometer is essential.

The fundamental tone audiometer is a vacuum tube instrument that produces tones, pure within certain limits, at frequencies calibrated at full or at half octaves or better still at octave letters from 128 or lower to 8,192 or higher cycles per second and at intensities calibrated in decibels of hearing loss. Here the tone of the time-honored tuning fork loses its objectionable, but inherent, element of decay and can be increased, decreased or held constant at any frequency with any intensity for any length of time the observer desires. All information the forks gave in the classic Weber, Schwabach, Rinne and other tests is obtained with greater ease, accuracy and speed by the audiometer.

Of the five audiometers now generally available, I have tested four clinically. These are Western Electric 6-A, Sonotone-Knudsen,[4] Maico and Otologist Service. The results are shown in figure 3.

Wave form was good above, but not as good below, 1,024 cycles per second in each instrument. Whether this factor is really as important as most physicists and many otologists assume is yet to be determined. Actual clinical experience with deafened ears in the otologist's office, where painstaking observation is possible and the cooperation of capable hearing aid consultants is available, will furnish the deciding evidence. The final answer is the patient, not the laboratory.

The heterodyne beat circuit (two tubes) of the Western Electric 6-A audiometer required bringing to

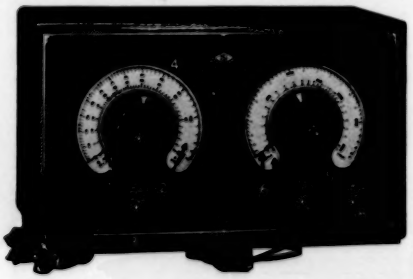

Fig. 4.—Otologist Service audiometer. Intensity calibration on the right, frequency on the left. 1. Intensity knob. 2. Intensity dial; single decibel step calibration from 0 to 60 decibels A scale and from 50 to 105 decibels for air conduction (B scale); overlapping from 50 to 60 is provided for convenience in testing at the upper end of the lower A scale and the lower end of the upper scale (B scale). 3. Intensity switch for A and B scales. For air conduction measurements both A and B scales are used, reading from 0 to 105 decibels. For bone conduction measurements, the switch is set at B but readings are made from the A scale from 0 to 60 decibels. It is to be noted that the difference (decibels) between the figures of these two scales is 45 in every instance. This is the difference between the bone and the air conduction thresholds, that much more energy being required to reach the threshold through bone conduction. 4. On and off signal light. 5. Frequency control knob, giving actual continous sweep. 6. Frequency dial and indicator, with calibrations at octave and octave letter intervals from 128 to 8,192 cycles per second. Forty-three test points are thus available for location of tone islands and tinnitus, study of diplacusis or other acoustic problems with 18 in the most important conversation range. This is all important for fitting hearing aids. 7. Frequency switch for low (to left lower numbers on dial) and high (to right upper numbers on dial) frequency scale. 8. On and off power switch registering in signal light at 4. 9. Air conduction receiver with soft rubber ear cushion. 10. Bone conduction receiver.

zero beat (setting on calibration) frequently. Background noise was not sufficiently cut down. Dial calibration should be more legible. Wave form was good and sweep frequency really continuous, the latter being very important for diagnosis of otologic disease and prescription of hearing aids.

The Sonotone-Knudsen, Maico and Otologist Service audiometers use single tube oscillator circuits. These are known to be more stable in performance

Fig. 5.—Sonotone Audioscope, a "master hearing aid." Just as the trial frame enables the patient to see through the lens combinations indicated by the retinoscope, the master hearing aid permits hearing through the component hearing aid parts as determined by the audiometer. Three of the four major manufacturers use these instruments: Radio Ear the Sekxaphone, Acousticon the Auroxage, and Sonotone the Audioscope. 1. Transmitter. 2. Transmitter adapter replacing the cord of the portable hearing aid. 3. Transmitter receptors, 1, 2 and 3, into which transmitter adapters fit. 4. Transmitter switch connecting receptors 1, 2 and 3. 5. Battery switch. 6. Volt meter. 7. Milliammeter indicating amount of current passing through transmitter. 8. Milliammeter indicating amount of current passing through receiver. 9. Volume control for receiver circuit (taking place of control button on hearing aid transmitter). 10. Volume indicator for receiver circuit. 11. Amplifier base to hold carbon chambers in position for testing. 12. Amplifier carbon chamber, low, standard, medium, high and three specials. 13. Compartments for receivers and cords: A (white) cord, to which the four midget and the original circular air receiver can be attached; —.2 (red), —.4 (amber), —.6 (green) cords to which high, medium or low pitched bone conduction receivers (oscillators) are attached. 14. Compartment for transmitters, air receivers and accessories. 15. Receiver switch, which throws any of the receivers (A, .2, .4, or .6) into circuit. 16. Pilot lights (white, red, amber, green), which indicate which receiver is in circuit. 17. Switch (to the left simplified, to the right amplified) by which the amplifier can be cut either in or out of circuit. The latter (to the left) is essentially Alexander Graham Bell's original hearing aid circuit.

and less noisy in operation. Their wave form, however, is apt to be poor below, but good above, 1,024 cycles per second. This is especially true if continuous sweep frequency is provided in the conversation range.

Sonotone-Knudsen has excellent wave form throughout. It is well constructed and easy to operate. Its sweep frequency, while actually continuous, is above the conversation range, beginning at 2,500 cycles per second.

Maico has good wave form throughout but its "sweep check" is not actual continuous sweep frequency. The uniform zero level is commendable. It affords a modern means of testing hearing.

The wave form of the Otologist Service audiometer is admittedly not pure below 1,024 cycles per second. The octave letter and single decibel step calibrations and the sweep frequency, which is actually continuous throughout, were found to be of great value in locating tone islands and prescribing hearing aids. The lack of purity of wave form below 1,024 cycles per second seemed of little clinical importance, especially in fitting hearing aids.

4. Previously tested and reported in Hayden, A. A.: Audiometers and Hearing Aids, J. A. M. A. **110**: 723-725 (March 5) 1938.

Excellent features were found to be common to all. Clinical observations were quite consistent. With any of the instruments, hearing can be measured more accurately and rapidly than with any previous methods or instruments. The audiogram is the best means of recording hearing loss for diagnosis of otologic disease, fitting of hearing aids and medicolegal purposes (including the detection of malingering). Standardization will increase its value. Otologists and the hard of hearing are deeply indebted to the designers and manufacturers of audiometers.

In the belief that otologists, if enabled to prescribe hearing aids from their own audiograms, could be of even greater service in ameliorating the devastation of hearing loss, and in the further belief that manu-

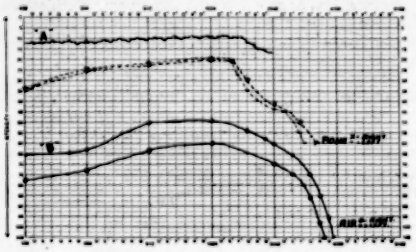

Fig. 6.—"A" shows the hearing of the patient with and "B" the hearing of the patient without the hearing aid. The difference between the lines "A" and "B," approximately 40 decibels, shows improvement made by the hearing aid. This improvement in terms of distance would be from 2 feet without to 10 feet of hearing with the hearing aid. Audicle prescription: response chart No. B-12, audicle combination C-7-6-4.5 volts, right ear.

facturers could therewith construct even better instruments—more closely adapted to the individual patient's needs—and could fit these more rapidly, thus reducing the fatigue error, I suggested a study of this entire subject to the executives of the Sonotone Corporation. This company was selected because its announced policy was to use only otologists' audiograms for fitting hearing aids and because it agreed to include in the study manufacturers of other acceptable instruments and to submit all data to the Council on Physical Therapy of the American Medical Association.

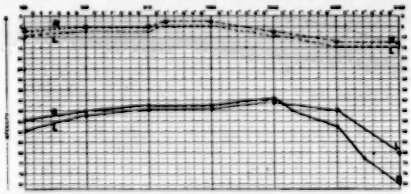

Fig. 7.—Chart of hearing of patient with conductive (middle ear) deafness; bone conduction normal or nearly normal (loss not greater than 10 decibels); air conduction poor (loss greater than 50 decibels); bone conduction aid prescribed. Audicle prescription: response chart No. B-6, audicle combination 451 C-3-4-1.5 V, right ear. Hearing improved from 3 feet to 25 feet.

For this type of deafness "hearing windows" have recently been advocated instead of hearing aids, especially when the ear is dry. In no instance was the hearing improved as much by the operation as it usually is by a hearing aid. The indications, if any, for the operation seem thus far to be largely cosmetic.

Accordingly, in the late summer of 1937 Otologist Service, Inc., was established independent of Sonotone Corporation. The Marvel audiometer was redesigned and rebuilt as the Otologist Service audiometer. The responses of Sonotone audicles (hearing aids) were made into Marvel's ingenious base-fitting charts on sheets of translucent paper that could easily be placed over audiograms for comparing ("matching") the latter's curves of hearing loss with the former's curves

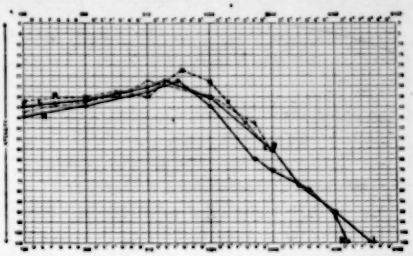

Fig. 8.—Chart of hearing of patient with perceptive (nerve) deafness; loss in air and bone conduction about equal; air conduction aid prescribed. Audicle prescription: response chart No. A-11, audicle combination 451 E-3-H-3 V, left ear. Hearing improved from 3 feet to 11 feet.

of sound amplification. Audiometers and these base-fitting charts were made available to a small group of otologists for this study.

Since Jan. 1, 1938, 1,000 audiograms have been made. Three hundred of these have been studied and "matched" and the component hearing aid parts assembled in the Audioscope (fig. 5) according to the otologist's prescription. These "trial frame" fittings have been checked by speech intelligibility tests (syllable, word or sentence), by subsequent audiograms of the patient wearing the assembled hearing aid (fig. 6) or by both.

The results were surprisingly accurate. Ninety-two of the first hundred patients, all examined by one expe-

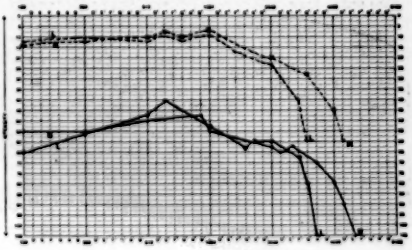

Fig. 9.—Chart of hearing of patient with mixed conductive deafness; bone conduction fair (average loss less than 20 decibels); air conduction poor (average loss greater than 50 decibels); bone conduction aid indicated. Audicle prescription: response chart No. B-6, audicle combination 451 C-3-4-3 V, right ear. Hearing improved from 18 inches to 18 feet.

rienced observer, preferred, from the 288 possible combinations already referred to, the exact combination the otologist had prescribed. One hundred and forty-six, examined by less experienced observers, chose combinations very close to the prescription, and most of the remaining fifty-four did not vary greatly in their choice from the prescription. In every instance the audiogram was invaluable in reducing the time and consequently the fatigue of the fitting.

Complete examination of the ears, nose and throat by the otologist, as well as a general physical examination by the family physician, with such laboratory and other special work as may be indicated, is essential to secure the best results. Many mistakes in fitting can be avoided by securing the cooperation of parents, teachers, nurses, ministers and members of leagues for

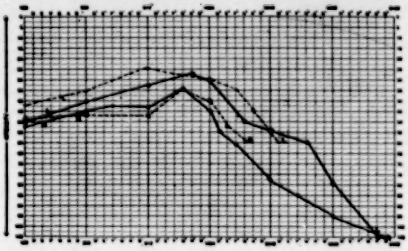

Fig. 10.—Chart of hearing for patient with mixed perceptive deafness; bone conduction loss from 10 to 20 decibels less than air conduction loss; air conduction aid prescribed. Audicle prescription: response chart No. A-13, audicle combination 451 E-1-B-3 V. Hearing improved from 18 inches to 9 feet.

the hard of hearing. With such help many more instruments will be prescribed and worn.

From this and other experience available, the following general rules are postulated: A hearing aid is indicated (1) when air conduction loss is greater than 25 decibels in each ear or (2) when air conduction loss is not greater than 85 decibels in the better ear. The vacuum tube amplified hearing aid often helps in cases of greater hearing loss.

Choice of a bone or an air conduction hearing aid depends on the character and relative amount of hearing loss by each type of conduction. The audiogram deter-

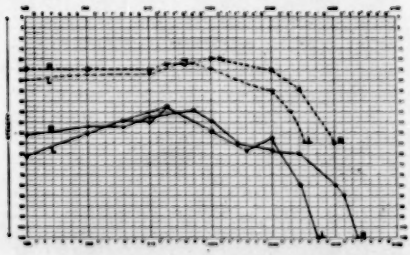

Fig. 11.—Chart of hearing for patient with mixed deafness (borderline case); bone conduction loss one half of air conduction loss; choice of air or bone conduction aid depending on (1) speech intelligibility tests with master hearing aid and (2) audiogram of patient wearing hearing aid. Audicle prescription: response chart No. B-7 or A-5, R-bone 451 C-3-4-3 V, R-air 451 E-1-M-4-3 V, right ear. Hearing improved by air conduction from 18 inches to 11 feet and by bone conduction to 13 feet.

mines this and classifies hearing loss as indicated in figures 7, 8, 9, 10 and 11.

Which ear should be fitted, right or left, is also indicated by the audiogram:

1. If the difference in air conduction is greater than 20 decibels and the difference in bone conduction is less than 10 decibels, fit the ear with the greater loss for air conduction.

2. If the difference in air conduction is less than 20 decibels and the difference in bone conduction is greater than 10 decibels, fit the ear with the smaller loss for air conduction.

Improvement of hearing, such as is shown in the accompanying table, is usually obtained.

Selective amplification is of great importance and in need of much more clinical study as well as more laboratory observation. Already the rule that "peaks of amplification" of the instrument should not be "matched" to peaks of better hearing in the audiogram is well established. Such matching produces distortion.

It seems logical and probable, but has not yet been proved to physicists' satisfaction, that the amplification of the hearing aid should be peaked at the valleys of hearing loss as shown by the audiogram. Verification by wide clinical experience (several thousand fittings) would be convincing evidence, even though full laboratory confirmation was lacking.

Despite the efforts of Newhart and his committee; the constructive genius of Fowler and Fletcher, Jones

Hearing Gain by the Carbon Transmitter Type of Portable Aid

Air Conduction Loss, Decibels	Residual Hearing	Improvement in Speech Intelligibility by Fitting	
30 to 40	4 to 6 ft.	12 to 16 ft.	75%
40 to 50	2 to 4 ft	10 to 12 ft.	75%
50 to 60	12" to 2 ft.	8 to 10 ft.	70%
60 to 70	6" to 1 ft.	6 to 8 ft.	70%
70 to 80	2" to 6"	4 to 6 ft.	65%
80 to 90	1" to 2"	3 to 4 ft.	60%
90 to 100	None	???	???
Bone Conduction Loss, Decibels			
0 to 10	Overall (air conduction)	20 to 30 ft.	80%
10 to 20	loss of hearing	15 to 20 ft.	75%
20 to 30	not directly	12 to 15 ft.	75%
30 to 40	related to	9 to 12 ft.	70%
40 to 50	bone conduction	6 to 9 ft.	65%
50 to 60	loss	3 to 6 ft.	60%
60 or more		???	???

and Knudsen; the leadership of Shurly for the Section on Laryngology, Otology and Rhinology in the House of Delegates of the American Medical Association; the enthusiasm of Wherry's bulletins of the American Academy of Ophthalmology and Otolaryngology; the fine papers of Nash and others read at the 1938 meeting of the American Laryngological, Rhinological and Otological Society; the continuous interest in research of the American Otological Society, and the work of the Council on Physical Therapy, directed by Howard A. Carter and the Committee of Consultant Otologists,[5] otologists must immediately take greater interest in audiometers and hearing aids or else the use of the former and the prescription of the latter will be taken over by others not so well qualified to serve the hard of hearing.

Research such as Otologist Service, Inc., has initiated (coordinating the efforts of otologists, physicists and manufacturers of acceptable hearing aids) offers the ideal practical plan by which otology may continue to serve in this increasingly important field of its own domain and greatly benefit America's millions of deafened.

25 East Washington Street.

5. This committee is composed of Drs. George M. Coates, Lee Wallace Dean, Edmund Prince Fowler, Austin A. Hayden (chairman), Isaac H. Jones, Douglas MacFarlan, Burt R. Shurly, Horace Newhart and William P. Wherry, and Mr. Howard A. Carter (secretary).

WHAT AUDIOMETRY CAN NOW MEAN IN ROUTINE PRACTICE

ISAAC H. JONES, M.D.
AND
VERN O. KNUDSEN, PH.D.
LOS ANGELES

The otolaryngologist is aware of a criticism directed at him. He is known to be devoted to every phase of his work except one field—service to the hard of hearing. Why is this? It seems to us that the fault is both in the patient and in the physician. The lack of interest in this field is easily explained. In his work as a specialist the otolaryngologist finds his real interest, just as specialists do in other fields, in a contented and satisfied patient. The otolaryngologist often sees definite results and on occasion has the satisfaction of knowing that he has actually preserved a life. He is human, and there is nothing that pleases him so much as a grateful patient. When it comes to the problems of hearing, however, he has found it very difficult to bring about a result satisfactory to the patient. The otolaryngologist is bound to feel at some time "Oh, what's the use!" He cannot help realizing that the patient puts a low estimate on his diagnostic studies. For example, a recent letter took nine pages to explain the history and symptoms and requested that an examination be made particularly for the purpose of prescribing a hearing aid. It ended "Do you make any charge for such a study?" Usually the patient who is hard of hearing is not satisfied unless his hearing is restored.

To be sure, one should not speak of "fixed" lesions; to do so expresses an attitude of hopelessness. The day when tuberculosis had the general reputation of being a hopeless condition can be recalled. Cancer is no longer regarded as necessarily fatal; many patients are saved by early diagnosis and treatment. In the spirit which improved the prognosis in these diseases, the physician must forever struggle on in the attempt to "cure deafness." At the present time much work is being done in this and other countries that gives promise of a brighter prospect. However, although the otolaryngologist must never permit himself to have a pessimistic attitude, he must face facts. Some more or less reasonable and many bizarre methods have been tried in the treatment of the chronically deafened, only to be abandoned. The physician no longer expects the ridiculously impossible, but most patients still do.

However, the physician should not be content simply to lay the blame on the extravagant demands of the patient. He deserves criticism if he is not ready to advise and direct the patient to the fullest extent possible. He must be prepared to meet the need. He is now able with precision to measure and diagnose conditions of the middle and internal ear and then to give intelligent advice or treatment. He can also, as the ophthalmologist has done for so many years, prescribe the type of aid best suited to each patient, and in many instances he can secure an instrument that will meet his prescription. The instruments of precision for diagnosis are available, and yet very few otolaryngologists use them. It is freely admitted everywhere that a careful study of a hard of hearing patient should include the vestibular tests and audiometric tests with a standardized audiometer in a soundproof booth. Without the vestibular tests, only one half of the ear is examined; that is, the ear is only half examined. Yet the fact remains that in 1938 many otolaryngologists do not even possess a turning chair; some at last are securing audiometers, but soundproof booths, without which any hearing test is wofully inadequate, are practically unknown.

Besides the vestibular tests and the use of an audiometer in the soundproof booth, there is another test which we have found of such value that we have used it as a routine for fifteen years—a study of the mechanism of the middle ear by a pneumatic oscillator with an electric otoscope. To "see the ear hear" is not merely an attractive thought. To a great extent it is perfectly possible to accomplish this in clinical practice. Naturally, we cannot observe the motion of the drum membrane when it is exposed to sound waves. The motion is too tiny and too rapid. The ear is wonderfully sensitive. At a frequency of 1,000 cycles a barely audible sound is heard when there is a pressure variation of only one billionth part of atmospheric pressure in the auditory canal. At this threshold of hearing the drum membrane moves one billionth of an inch. For lower frequencies the excursion is somewhat larger. For an ordinary sound, such as the voice or the average noise in the office, the drum membrane moves one millionth of an inch. Such movements we are not able to see.

Again, we cannot see the drum membrane move because it moves too rapidly. The eye has detectors for only one octave, from red to violet; double the frequencies for red are sensed as violet. In the ear there are ten octaves, from twenty to twenty thousand cycles. We cannot see such rapid movements. "How, then, can we see the ear hear?" We can at least observe the motion of the drum membrane and hammer, and to this extent we can know exactly how well this portion of the ear can hear. An oscillator with the electric otoscope causes an alternate rarefaction and condensation. We can cause the drum membrane to move about one hundredth of an inch, and such excursions are plainly visible. As to frequency, we can cause the membrane to move three, four, five or any number of times per second. In this sense we are then able to "see the ear hear." Clinically we determine stapes fixation as follows: If the turning and caloric tests and the audiometric tests in the soundproof booth reveal a normal internal ear and eighth nerve, the deafness is proved to be due to a conductive defect and the oscillator with the electric otoscope shows normal texture and normal mobility of the drum membrane and hammer handle, we can conclude that there is only one diagnosis, one definite lesion, stapes fixation.

At long last the otolaryngologist is beginning to recognize that audiometry is not only a legitimate but a necessary part of his practice. He no longer inquires "Should I have an audiometer?" but rather asks "What kind of an audiometer should I get?" Not only are otolaryngologic societies attempting to standardize tuning forks and the tuning fork tests; they have committees at work setting up many minimal standards for acceptable audiometers, and they are earnestly endeavoring to establish educational programs for the teaching of audiometry (1) to active otolaryngologists and (2) to medical students, particularly those about to specialize in otolaryngology.

From the Department of Physics, University of California (Vern O. Knudsen).
Read before the Section on Laryngology, Otology and Rhinology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

Much progress has been made during the past year, and substantial agreement has been reached by the committees of the many societies as to the minimal standards for audiometers. Briefly, the standards set forth the following specifications:

1. The audiometer shall provide at least the following tones: 128, 256, 512, 1,024, 2,048, 4,096 and 8,192 cycles.

2. The intensity of the tones shall be controllable, and intensity steps corresponding to five decibel intervals (or less) shall be identified, both for air conduction and for bone conduction.

3. The frequency of any test tone shall remain within plus or minus 5 per cent of the designated frequency.

4. The tones produced by the air conduction receiver shall be free from audible overtones.

5. Extraneous noises must be inaudible.

6. The bone conduction receiver shall not produce sound in the air to the extent that the sound reaching the tympanum can influence the validity of the bone conduction measurements.

7. The air conduction receiver shall have an acoustic power output directly proportional to the electric power input.

8. The audiometer blanks shall use the same base line for both air conduction and bone conduction. In order that all charts may present the same visual impression, it is recommended that there be a ratio of 1 to 2 between the dimensions of a 10 decibel step and that of an octave step.

Good audiometers have developed to such a degree that the otolaryngologist is now able to purchase one with the assurance that it will not be necessary to make a trade for a new one for at least five or possibly ten years.

The audiometer should be set up in a very quiet room or soundproof booth. The accuracy of many hearing tests, especially by bone conduction, will depend directly on the extent to which the room is free from noise. If the patient can hear any noise whatever in the room, the test tones will be heard not until they become inaudible but until they are masked by the noise in the room. The faint tones would still be heard if it were not for this noise. Figure 1 shows the plan of a small inexpensive booth which can be built by any good carpenter; it will prove satisfactory if located in a reasonably quiet room.[1] In noisy locations a double-wall type of booth, such as that shown in figure 2, is recommended. If ventilation is desired it can be provided by small supply and exhaust ducts, with a small electric fan used with either duct. Both the exhaust duct and the supply duct should be at least 6 feet long, should have a cross section of not more than 1 inch by 4 inches, and should be constructed of sound-absorptive material or of galvanized iron lined with one-half inch mineral wool blanket, such as one-half inch Fir-Tex, Masonite or similar material. Such ducts offer a high attenuation to sound and therefore will prove effective in eliminating outside noise. Although ventilation is desirable for a prolonged test, it is by no means necessary for routine work.

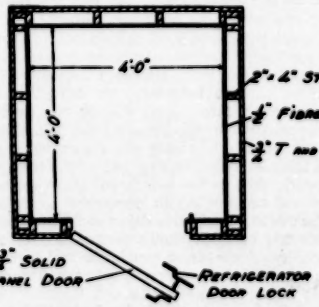

Fig. 1.—A simple and inexpensive type of booth which can be constructed for about $100. The ceiling should be constructed in the same way as the walls; for the floor the fiber board should be applied directly to the T and G subflooring. The door jamb should be lined with soft rubber so that the door will lock tightly against the jamb and thus eliminate all threshold cracks. If there is much vibration in the room where the booth is to be located it will be helpful to support the booth on 1 inch thick live rubber pads, one at each corner of the floor, of such size that the rubber is loaded to 6 pounds for each square inch of bearing surface. (Thus, if the booth and its contents weigh 600 pounds, each pad should measure 5 inches by 5 inches by 1 inch.) This booth will provide an insulation of about 30 decibels.

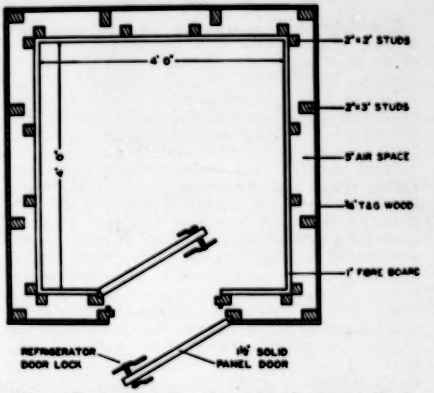

Fig. 2.—This booth is built on the principle of a "room inside of a room." That is, the inner room, with its own floor (of wood covered with fiber board), ceiling and door, is effectively separated from the outer room. The only points of contact between the two rooms are through the floor; the inner room should be supprted by rubber pads as described in the legend for figure 1. The cost of this booth will be about $150 to $175. If ventilation is provided for this booth, care should be taken to prevent rigid connection between the outer and inner walls by means of the ventilating ducts; rubber or canvas connections will prove satisfactory. This booth will provide an insulation of about 50 decibels, but if it is to do this the doors must be locked tightly against rubber jambs and there must be effective isolation of the inner from the outer room.

The following case reports are included for two reasons: (1) to present our methods in the study of patients and (2) to put on record certain unusual cases, the understanding of which would have been difficult without precision measurements. In fact, without precision measurements, the diagnosis in these cases would have resolved itself largely into a matter of mere guesswork.

The cases include one of chronic catarrhal otitis media in which the progressive deafness was stopped by surgical intervention fifteen years ago; three of otosclerosis (one patient was deaf at birth, in one case deafness manifested itself after adolescence and in the third case deafness appeared at the age of 47) and one case each of arthritis of the ossicular joints, sudden deafness

1. Knudsen, V. O., and Jones, I. H.: Bone Conduction, Arch. Otolaryng. 13: 489-505 (April) 1931.

V 19

from acute syphilis, neuroma of the eighth nerve, cerebral auditory defect and deafness from psychoneurosis.

CASE 1.—*Chronic catarrhal otitis media.* Mrs. G. L. M. had normal vestibular function and normal bone conduction. The defect was purely conductive. Each ear showed impaired mobility of the drum membrane and the hammer handle, a dull tympanic membrane and retraction, with shortening of the light spot. The patient had been becoming progressively deaf for several years. For two years she had had tinnitus, like a roaring or, at time, the ringing of bells. The tinnitus had gradually increased until it was very distressing. After tonsillectomy and resection of the septum the progressive deafness stopped entirely and the noises disappeared at once. There has been no recurrence in fifteen years.

We have been unable to find a record of a case like the following, in which not only was the child apparently born with otosclerosis but the focus had already involved the oval window and produced complete bilateral stapes fixation. No doubt there are many such cases and the only reason for their not being on record is that precision measurements are so seldom made. It is known that the focus of otosclerosis does not "appear" or suddenly develop after adolescence. Histologic studies have demonstrated this in a child aged 3½ years (Manasse), in a child aged 5 years (Siebenmann and O. Mayer, one case each), in a child aged 1 year and 10 days (Guild) and in a fetus aged 7 months (Guggenheim). After Guggenheim's observation in 1931, Bast demonstrated a similar condition in several fetuses. These authorities did not state dogmatically that the sections demonstrated otosclerosis; however, they described dystrophic bone showing the characteristics of otosclerosis.

CASE 2.—*Otosclerosis.* D. D., a boy aged 5, when first examined appeared to be a typical deaf-mute. He was able to make sounds but they were unintelligible. The mother had been in perfect health throughout pregnancy; the birth was normal in every respect; forceps were not used; the baby developed normally and had no disease in these first five years.

Dr. Gilbert Roy Owen demonstrated the presence of the bony internal ears by roentgenograms. We then considered that there probably was a lesion of both internal ears, produced before birth by an unknown cause; but audiometric measurements reversed this concept. The child was most intelligent, and by careful checking we were able to satisfy ourselves that our chart was accurate. In the right ear the average hearing by air conduction was 42 per cent but by bone conduction was 80 per cent. The left ear showed an average air conduction of 30 per cent but bone conduction was 80 per cent. The child heard well with the high quality amplifier both by our large laboratory model and by our portable model. His parents volunteered the information that he seemed to hear better in the presence of a noise. It therefore appeared evident that, although he did not have perfect internal ears, what kept him from hearing was definitely a conductive defect, bilateral. The oscillator with the electric otoscope showed normal texture and mobility of the drum membrane and normal mobility of the hammer handle in each ear. So perfect was the mobility that the impression was that he had never had any trouble of any kind in the middle ears, and the parents confirmed this. It seemed certain that no chronic adhesive process within the middle ears could be responsible for such a total conductive defect. In brief, he had a conductive impairment not due to a lesion of the middle ear. The function of each cochlea not only was good but was far better than the air conduction. There was only one location and one explanation to account for this conductive defect—stapes fixation in the oval window.

With a specially constructed instrument, a high quality amplifier, this boy can hear well. There is every hope that he will be able to speak perfectly after education of his cerebral auditory centers. We then examined his sister, aged 7 years, and she showed a similar picture, although not of such marked degree.

CASE 3.—*Otosclerosis.* Miss E. G. L., who had typical otosclerosis, exhibited impairment of hearing shortly after adolescence (fig. 3).

CASE 4.—*Otosclerosis.* Miss J. L. showed perfectly normal vestibular function by means of the turning and caloric tests (fig. 4). The bone conduction showed good cochlear function (fig. 5). The hearing defect was purely conductive. The oscillator with the electric otoscope showed normal mobility and texture of the drum membrane and normal mobility of the hammer handle, indicating that the lesion was stapes fixation. Examination gave the same results for the two ears. At first the differential diagnosis was between arthritis of the ossicular joints and otosclerosis. The patient had had arthritis of the spine for years, with occasional exacerbations. However, the normal mobility of the visible parts of the conducting mechanism and the typical picture of otosclerosis demonstrated in her sister seemed to remove any doubt and to make the diagnosis one of otosclerosis.

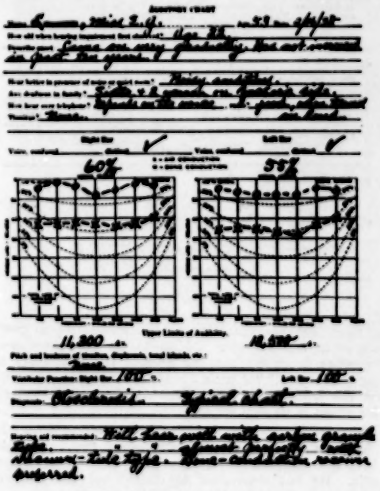

Fig. 3.—Auditory chart, case 3.

Whereas patient 2 appeared to have been born with complete stapes fixation from otosclerosis, patient 4 had excellent hearing until she was 47 years of age. These two cases show that otosclerosis can involve the conducting mechanism at a widely variable time of life.

CASE 5.—*Stapes fixation from arthritis.* Mrs. H. C. had had a severe illness, from which she nearly died, which began with a throat infection, took the form of staphylococcic bacteremia and resulted in severe osteomyelitis of the spine. In the midst of this illness she became deaf in the right ear. Two years later the air conduction curve for this ear showed almost no hearing for the lowest tones, better hearing for the high tones and an almost normal upper limit of hearing, the classic curve of conductive deafness. Bone conduction was normal. The Weber test markedly referred to the right, the deaf ear. The oscillator with the otoscope demonstrated normal texture and mobility of both drum membranes and normal mobility of each hammer handle. In other words, there appeared to be nothing in the middle ear itself to account for this purely

conductive impairment in the right ear. A diagnosis was made of stapes fixation in the right ear, due to arthritis.

The patient was naturally fearful that she had otosclerosis and that she would soon become deaf in her other ear. She was assured that she did not have otosclerosis; that the lesion had happened once and for all, caused by the bacteremia, and

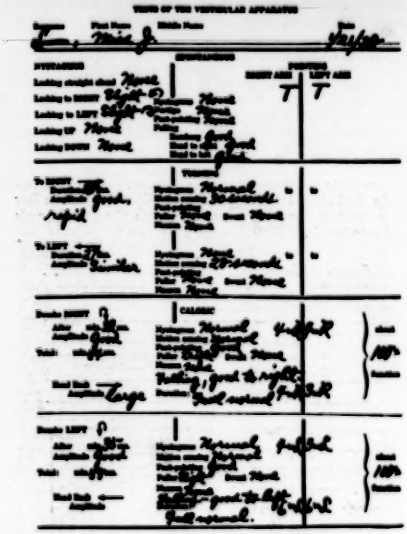

Fig. 4.—Results of vestibular tests, case 4.

that there was no reason for her to anticipate any trouble whatever in her left ear. Of course we had some mental reservations in stating such an opinion, but nine years has passed and she still has perfect hearing in her left ear. Clinically, this would seem to establish the diagnosis of arthritis of the stapes in its oval window.

Case 6.—*Deafness and blindness from acute syphilis.* Mr. G. A. G. on arising in the morning noticed that he was deaf in both ears and had loud tinnitus like the noise of a steam whistle. He had determined to commit suicide. Although he was a cabinet maker of some intelligence, he followed the advice one reads in advertisements and went to a hearing aid concern for "diagnosis and treatment." Probably the only reason that he left the audiometrist and came to us, after many weeks was that he could not hear with any kind of a hearing aid that the audiometrist offered.

In this case it was obvious that the sudden deafness overnight was due to either hysteria or neuritis of the eighth nerves. The diagnosis was of course determined in a minute or two, simply by the turning chair. If he had shown normal vestibular responses we would have known at once that the condition was hysteria. The first glance at his throat showed a typical picture of acute syphilis. There were mucous patches on the oral mucosa and left tonsil, and the tonsillar region was swollen almost as in quinsy. Dr. William D. Donoher found that he was also going blind. The disks were swollen and the margins lost; the arteries were of normal size; the veins were congested and tortuous and appeared to bulge as they passed up and over the edge of the swollen disks; physiologic excavation was not yet wholly obliterated.

The Wassermann test with a 1:40 dilution of serum showed a reaction of 4 plus. Dr. Herbert A. Huntington gave vigorous treatment with a course of fifteen injections of iodobismital with saligenin and ten injections of neoarsphenamine. The patient promptly recovered his vision and the hearing was restored, according to the statement of the patient, to a degree "as good as it was before this happened." During this experience it was possible to observe the successive stages of improvement by audiometric measurements, just as Dr. Donoher could watch the fundi improve.

Case 7.—*Neuroma of the eighth nerve.* R. S. had deafness which was easily diagnosed by the following sequence of events: The vestibular and auditory tests gave the usual picture of a neuroma of the left eighth nerve. Spontaneous nystagmus suggested that the neuroma disturbed the brain stem. When looking to the right the right eye went down; on looking to the left it went up and jerked to the left and down, and on looking up it went outward. At the first examination we asked the patient if he had any tumors in other parts of his body, and he showed a scar on his thumb, saying that a tumor had recently been removed. He was sent at once to Dr. Ray Taylor with a tentative diagnosis of multiple neurofibromatosis of von Recklinghausen (fig. 6). The remarkable report read: "There is indentation in the superior border of the petrous process on the left side. Immediately posterior there is an area of calcification, 1 cm. in diameter, lying close to the petrous portion of the temporal bone. This calcified mass appears to lie posterior and probably close to the internal auditory meatus." Then came the histologic report of the tumor that had been removed from the thumb—neurofibroma.

Case 8.—*Cerebral auditory defect.*—E. F., a man aged 22, was generally regarded as a deaf-mute, although it was realized by those who knew him that he was not entirely deaf. He was obviously a mute in the sense that he was unable to talk; he could utter only meaningless noises. To our surprise we found that he could hear well. Not only did all tones and noises register in his cerebral centers, but he had good hearing for all tones. To check this fact, three audiograms were made on

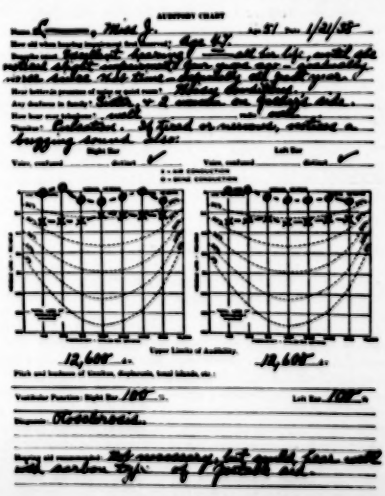

Fig. 5.—Auditory chart, case 4.

different days. He could reproduce tones; if someone hummed a certain note he could hum the same note. He could not speak, simply because he could not draw on the memory pictures of conversation that he had heard. He was unable to register and store up a concept of names and words. When he was 5 years old the family suddenly noticed that he did not understand what was being said to him and reached the con-

clusion that he was deaf. At the age of 2 he had had an illness diagnosed as encephalitis. At the age of 13 he suddenly jumped at the sound of an automobile horn, and the family then realized that he could hear. They naturally thought, however, that he could hear very little, because he did not understand speech and could not repeat words that were said to him.

The neurologic report of Dr. Eugene Ziskind gave the following facts:

1. Visual agnosia: There was no visual agnosia for objects or figures. The patient knew only a few words, possibly twelve; he was able to recognize the word "cat" in writing. His brother stated that it had never been possible to teach him the sign language for letters but that he was able to learn the code for words and communicated by this method. He could match colors shown him, but the only one he could recognize by name was blue. His brother stated that blue was one of the few words in his vocabulary. There was no loss of orientation, since the previous year the patient had hitch-hiked from Oklahoma to California. There was no acalculia; the patient was able to go to the store and did not permit himself to be short changed.

2. Auditory agnosia: He recognized the few words he knew. The examiner pointed to "cat" and said "Is this mamma?" He shook his head in the negative and said "titty" for "kitty." The examiner then pointed to the word "mother," which was one of the words he had written, and asked "Is this show?" He shook his head in the negative. When asked "Is this mamma?" he nodded in the affirmative. When asked to repeat, mamma, show and kitty, he did so. When asked to repeat words that he did not know, such as house, he failed to do so or made a sound which was irrelevant.

3. Aphasia tests: There was no spontaneous speech. He could repeat only words he knew. He did not understand the spoken voice, his understanding apparently being limited to the words he knew. He did, however, communicate by the sign language.

There was no apraxia and no agraphia. The patient wrote his name spontaneously, copied, transposed from print to writing and wrote from dictation the words he knew.

The diagnostic impression was that the patient probably had lethargic encephalitis in the epidemic of 1917-1918, at the age of 2 years, at which time a focal lesion produced partial motor aphasia and incomplete auditory aphasia. The patient showed partial visual agnosia for words, but since the pathologic lesion occurred before he learned to read or write it may be that the deficiency in this direction is to be ascribed to lack of training rather than to an organic loss. If one is to assume that the patient had visual agnosia in addition to the deficiencies noted, no focal localization is possible, and it may well be that the observations are to be explained by a diffuse lesion such as occurs in lethargic encephalitis.

CASE 9.—*Deafness from psychoneurosis.* Mrs. L. F. S., a gentle lady, had always prided herself on her acute hearing in both ears. Then came the railway accident. A wheel broke and the car went off the track; it did not turn over but pounded along over the ties. All the passengers were naturally excited, and some were in terror. The patient received no blow on the head. Three weeks later she noticed that she was deaf in her right ear and began to have pains on the right side of the head, especially above the right eye when stooping forward. Later she became hard of hearing in the left ear also. Several audiograms were made, and the curve was different each time. For example, in the right, deafer, ear she had an average the first day of only 25 per cent of hearing, the next day of 40 per cent and a few days later of 60 per cent. The vestibular tests showed actually hyperactive responses to turning and prompt responses to douching. It was clear that this elderly patient, as a result of a terrifying experience, had suffered a complete change in her outlook on life, and the diagnosis was clearly psychoneurosis.

It is a comfort to us to know that we need no longer have any concern about making a diagnosis of a functional hearing defect. The patient cannot deceive the audiometer. All that is necessary is to make two or more tests. Of course the differential diagnosis between psychoneurosis and malingering is determined by other factors, especially the judgment of the examiner.

THE PRESCRIBING AND FITTING OF HEARING AIDS

The prescribing and fitting of hearing aids will never become as intricate as the art of prescribing and fitting eyeglasses; that is, the kinds and gradations of sound amplification needed are fewer than the many kinds and gradations of light refraction. The audiometer provides a necessary and dependable guide in determining the type of amplification best suited to each individual. The prescribing of hearing aids is a service the otolaryngologist should now be prepared to render.

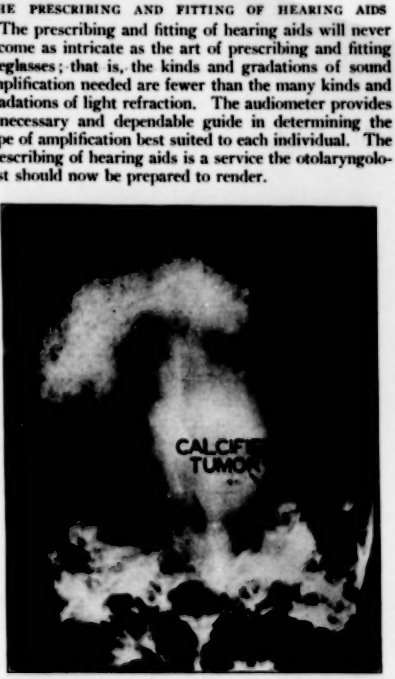

Fig. 6.—Neuroma, case 7.

Obviously, the responsibility for audiometry and the prescribing of hearing aids can and should be assumed by the medical profession. Persons who practice audiometry should have a thorough knowledge of the relation of impairments of hearing to the diseases of the ear, nose and throat and to the entire human body, but they must know more than this. They must learn the basic facts of physical and physiologic acoustics and learn how to apply these facts to the technic of audiometry and the prescribing of hearing aids. This is not a difficult task. Although training in audiometry ultimately should be given by the medical schools, much can be done in the meanwhile by those otolaryngologists and collaborating physicists who are familiar with the technic and who recognize the importance of rendering audiometric service to the public. The acceptance of this responsibility by the physician will help to keep audiometry and the prescribing of hearing aids where it belongs—in the medical profession. If otolaryngologists do not assume this responsibility and assume it without delay, there will soon be a new type of practitioner, "the audiometrist," who will operate outside the control of medical standards.

The prescribing of hearing aids should be based on the following tests:

1. Careful audiometric tests both by air conduction and by bone conduction for the purpose of determining (*a*) the type of impairment and (*b*) the extent of the impairment throughout the useful range of hearing. In cases of nerve impairment it is necessary to determine the hearing loss not only for tones of threshold intensity but for tones having intensities comparable to those which comprise normal speech and music.

2. Speech articulation tests with different types of selective amplification. The audiometric tests ordinarily will indicate the approximate type of amplification with which the patient will hear best; but this should be confirmed, or modified as required, by actual speech tests, which will reveal the type of amplification with which each patient will hear best.

The technic of prescribing and fitting aids is one which calls for close cooperation between the medical profession and the manufacturer, similar to that which now exists between ophthalmologists and optical concerns. The doctor has the responsibility, therefore, not only of making audiometric tests but also of referring his patients to reputable concerns which are competent to make the fitting and guarantee their instruments.

Respecting the criteria for prescribing hearing aids, the following already may be regarded as established:

1. The prime requisite for every hearing aid is high quality amplification; that is, amplification which is free from the "peaked" responses and nonlinear distortions which have been so characteristic of the carbon type of portable aid used in the past. In the carbon type of aid the distortions are so great and the variability of amplification so unreliable that it does not seem feasible for the otolaryngologist to attempt to prescribe a particular type of selective amplification with such aids. Only in the vacuum tube type of amplification is the quality good enough to justify the planned control of amplification at different frequencies in such a way as to meet best the needs of each prescription.

2. In general, air conduction hearing aids should be prescribed for persons who have primarily nerve or perceptive impairment, and bone conduction aids should be prescribed for those who have predominantly conductive impairment. As yet it is not possible to set down any fixed rule for the prescribing of bone conduction aids or air conduction aids for that large group of patients who have mixed conductive and perceptive impairments. The work of our colleague Dr. Norman A. Watson has shown that persons with normal hearing can hear as well by bone conduction as by air conduction, provided the amplification is sufficient. However, the rule previously stated will be found to be a good one for the two extreme classes; that is, air conduction aids for persons in whom perceptive impairment predominates, and bone conduction aids for those in whom conductive impairment predominates. Often the convenience of wearing the aid will be an important factor. Women may prefer a bone conduction aid because they can conceal the receiver behind the ear. Men may prefer an air conduction aid because a molded ear piece obviates the need of a head band. There is nothing mysterious about bone conduction; it simply makes use of another route to the cochlea. If sufficient sound energy of the proper frequencies reaches the cochlea it matters little whether it gets there by air or by bone conduction.

3. For persons with purely conductive impairment or even predominantly conductive impairment, an amplification at each frequency equal to the hearing loss in decibels minus 20 decibels is found to be adequate. Owing to the presence of noise, which interferes with the hearing of every one, at least to an extent of 20 decibels, it is not necessary to provide as much amplification as the audiogram indicates; in other words, all persons speak much louder than would be necessary if they were in a quiet place. It will be found that the amount of amplification here indicated, namely 20 decibels less than the hearing loss, will be adequate for good hearing and also will provide a more comfortable level of loudness than would a greater amplification. Further, for such persons, experience shows that uniform, high quality amplification usually will be as satisfactory as any kind of selective amplification. The only exception to this rule would be for those who show a marked variation in hearing acuity throughout the hearing range.

4. For persons with purely perceptive impairment or with mixed conductive and perceptive impairment it is generally desirable to provide more amplification for the frequencies for which the hearing losses are large than for those for which the hearing losses are small. However, it is a serious mistake to prescribe an amplification equal to the hearing loss at each frequency. The work of many investigators has shown that for persons with perceptive impairment the hearing loss for tones of normal intensity is considerably less than the hearing loss for tones of threshold intensity. This is especially true for tones of high frequency, which are the ones most involved in cochlear or nerve lesions.

A patient who has been thoroughly studied by N. A. Watson, L. Sepmeyer and ourselves has an air conduction loss of 50 decibels at 128 cycles, gradually increasing to a loss of 90 decibels at 4,096 cycles, with complete loss of usable hearing for frequencies above 6,000 cycles. With no hearing aid and with a man calling words to him in a normal conversational voice from a distance of 2 feet, he was able to hear correctly 78 per cent of the vowels and 23 per cent of the consonants, which corresponds to a standard syllable articulation of only 4 per cent. With a woman calling the words he could hear correctly only 36 per cent of the vowels and 15 per cent of the consonants, which gives the negligible syllable articulation of only 0.4 per cent. With his portable aid (carbon microphone, carbon booster and electromagnetic receiver) he could hear correctly 76 per cent of the vowels and 54 per cent of the consonants, giving a standard syllable articulation of 21 per cent. With a portable vacuum tube aid he could hear correctly 100 per cent of the vowels and 70 per cent of the consonants, giving a standard syllable articulation of 45 per cent. With high quality vacuum tube amplification (a laboratory instrument, not portable) with equal amplification for all frequencies and with the optimal amount (42 decibels above threshold) of amplification, he could hear 100 per cent of the vowels and 80 per cent of the consonants, giving a standard syllable articulation of 60 per cent. When this uniform amplification was modified in such a way that the higher frequencies were given an amplification of 30 decibels more than the amplification provided for the low frequencies, he heard correctly 100 per cent of the vowels and 87 per cent of the consonants, giving a syllable articulation of 72 per cent. These results show

in a convincing manner (1) the advantage of high quality amplification and (2) the added advantage of the appropriate type of selective amplification.

These results are for one person, but they are based on an extensive series of tests, in which a total of 30,450 test syllables were employed. They are therefore reliable and accurate so far as this one person is concerned. Less exhaustive but similar tests on several other persons confirmed the conclusions drawn as to high quality and selective amplification.

It is our belief that these and similar observations open a new era for the hard of hearing, and recent trends in the development of vacuum tube aids in Great Britain as well as in this country indicate that a number of hearing aid concerns are aware of this approaching era.

It is true that the carbon or telephone type of aid has been developed to such a high degree that it has provided useful hearing for millions of hard of hearing persons who otherwise would understand speech only by lip reading or some form of sign language. Although such aids are often acceptable for intimate conversation, they fall far short of the necessary requirements for the satisfactory reception of speech in large rooms or for the distortionless amplification of music under almost any condition. The shortcomings of the carbon aid are particularly acute for those with advanced cochlear or nerve impairments. Often this type of instrument will overemphasize the background noise and reverberation to the extent that the nerve-deafened person will prefer not to hear rather than to suffer the loud and raucous noise produced by the instrument.

Even the most highly improved carbon type of hearing aid is subject to unavoidable distortions, inherent in the process by which it amplifies. The carbon type of instrument is capable of amplifying only a limited range of frequencies, about 300 to 3,000 cycles, and even for this restricted range there are undesirable "nonlinear" distortions. The first limitation means that those frequency components of speech and music which lie outside the restricted range, that is, below 300 cycles and above 3,000 cycles, are completely missing from the sound which has been amplified; the amplification is not uniform even throughout the limited range of frequencies for which the instrument does amplify, owing to the resonant action of diaphragms in the instrument. Nonlinear distortion means that the amount of sound which the instrument delivers to the ear is not proportional to the amount which strikes the microphone, and any instrument which responds in this manner introduces spurious frequencies in the amplified sound which did not exist in the original sound.

Vacuum tube amplification, the type used in the modern radio, is free from both frequency and nonlinear distortion; that is, it is capable of amplifying uniformly the entire range of frequencies which comprise speech and music, and it introduces no spurious frequencies. When a high quality microphone and a high quality earphone are used with a vacuum tube amplifier, the sound which reaches the ear is an amplified "facsimile" of the original sound. There are other meritorious features of vacuum tube hearing aids which every hard of hearing person should know: 1. Any required degree of amplification can be attained—sufficient for good hearing by bone conduction as well as air conduction—simply by using more vacuum tubes, and this is accomplished without sacrificing the quality of the amplified sound. 2. The amplification remains constant day in and day out over a long range of the life of the batteries and is uniformly good for all positions of the hearing aid. 3. The adventitious or background noise is very low, and consequently the aid is free from the hissing sound so characteristic of the carbon type aids. 4. Since the amplification is uniform for all frequencies (that is, there are no "peak" responses for certain resonant frequencies), it is not necessary to adjust the loudness of the instrument to as high a level as is required for the carbon aid, in which it is necessary to adjust the loudness to a very high level in order that certain frequencies, which are not amplified so much as the resonant frequencies, will be heard with adequate loudness. 5. By means of appropriate electrical filters in vacuum tube aids it is possible to amplify selectively the low, medium or high frequencies and thus provide the type of amplification best suited for each individual.

Much has been said and written respecting selective amplification and the prescribing of hearing aids; perhaps too much has been claimed by certain proponents of these new developments. For many persons uniform amplification without distortion will be as good as, or better than, any other kind of amplification, but for other persons, especially those who have nearly normal hearing for low frequencies and a marked impairment for high frequencies, we have found that selective amplification is of distinct advantage. Criteria are already developed, based on audiometric tests, whereby it is possible to prescribe the best type of hearing aid for each patient with impaired hearing.

For those who want the best in hearing and are willing to make a slight sacrifice in portability, the vacuum tube type of hearing aid should be recommended. Also those who can afford to buy two instruments will find that the vacuum tube instrument will perform unusually well in many situations, such as in the office, at the bridge table or at musicals, where the more portable carbon aid will not be so satisfactory. Finally, many hard of hearing persons, especially those with a marked nerve or perceptive impairment, will find the vacuum tube aid so much better than the carbon aid that they should use it exclusively.

With the familiar carbon type of aid there was very little the physician could do for hard of hearing patients except advise those who needed an aid to try out several of the leading instruments on the market. Even if he knew how to write the prescription for the best kind and degree of amplification required for each patient, he realized that it would not be possible to fulfill these requirements by any possible combination of microphone, carbon amplifier and ear piece which make up the assembly of the carbon type hearing aid. With the advent of high quality aids of the vacuum tube type, however, audiometry and the prescribing of hearing aids takes on a new significance and the otolaryngologist is able to perform an indispensable service to his patients.

To recapitulate, these are the practical benefits of this service:

1. The otolaryngologist can measure the exact amount of hearing that each patient has both by air conduction and by bone conduction. This is a prime requisite for an intelligent approach to the hearing problem presented by every patient.

2. He can diagnose impaired hearing and determine how much of the impairment is of a conductive or purely mechanical type and how much of a cochlear, or perceptive, type.

3. He can determine whether any hearing aid should be recommended. Although there will be some exceptions, the following will serve as a working rule: All patients who have a loss in excess of 25 decibels (35 decibels at 4,096 cycles) throughout the range of 256 to 4,096 cycles should have a hearing aid.

(*a*) If the loss does not greatly exceed these limits, and especially if the loss is largely conductive, it is probable that the carbon type of aid should be recommended, because of its greater convenience and lower cost.

(*b*) If the loss is much greater than these limits, that is, if it is greater than 50 decibels throughout the range of 256 to 4,096 cycles, and especially if it is largely of the cochlear, or perceptive, type, a high quality vacuum tube aid should be prescribed.

(*c*) If the impairment is primarily conductive, a bone conduction type of receiver is indicated; if it is primarily perceptive, an air conduction type. If conductive and perceptive impairments are approximately equal, choice should be based on thorough test of both types.

(*d*) If the loss of hearing is largely perceptive and is much greater at high frequencies than at low ones, a high quality vacuum tube type with appropriate emphasis of the high frequencies is indicated.

4. If a definite choice of instrument is not indicated by the audiometric tests, recourse should be made to careful speech articulation tests.

As the science and art of audiometry progress, more specific criteria and procedures than those here presented will become established; but even now the otolaryngologist can and should take over the use of audiometry in serving his hard of hearing patients. If he does not, others will.

1930 Wilshire Boulevard.

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. HAYDEN AND DRS. JONES AND KNUDSEN

Dr. William P. Wherry, Omaha: Otology has been content to disregard the criticism of courts of law as well as of contemporary medicine, who have asked that methods be created whereby deafness can be allocated into ratios and percentages; that a record and a system be devised whereby a visual interpretation can be made by others than the person making the tests. Furthermore, that hearing aids for the deafened be prescribed by measurement, much as glasses are now, rather than by a trial and error method. Otology, therefore, must awaken from its lethargic poise and seriously consider ways and means to satisfy the demands now before it. Tuning fork tests primarily differentiate conductive from nerve deafness, which conclusion is of little interest to industry or courts of law. Likewise voice tests, with or without a poise apparatus as an adjunct, may be classified in the same way. The potential variables among examiners makes accuracy of parallel recording almost impossible. The present day audiometers may be inaccurate; nevertheless, these instruments are tangible proofs that efforts are being made to develop a precision control. Within the past year a continuous frequency audiometer has been developed which can be produced on a low cost basis and which seemingly is giving a satisfactory return on both air and bone conduction. An audiometer built for clinical medicine may not be usable for research purposes; however, from the point of view of universal acceptance audiometer production must be approached from a low cost level even if specific instruments are to be built separately for research activities. The theme developed in the papers for which this discussion has been prepared is timely. The art of medicine is as essential to good medicine as is the science of medicine; neither can be divorced from the other in clinical practice. Applying this commitment to the management of deafness, it should follow that examination records should be plainly interpretative and the facts visibly available to any one rechecking them. Only through some such program can otology hold a place in sound contemporary medicine. It must be granted that audiograms are a move toward the final objective, which objective has not been realized through tuning forks and voice tests. The ultimate objective will be in the offing when (1) audiometers are built simply and accurately for clinical use and (2) production is large enough to create a low cost level. I cannot close without saying a word of praise for the Council on Physical Therapy of the American Medical Association, which, through a sincere effort, has forced the issue of deafness evaluation on those who practice otology.

Dr. Horace Newhart, Minneapolis: Audiometry has made possible extensive research which recently has yielded important basic knowledge concerning some of the unproved but suspected causes of impaired hearing and has made possible greatly improved means for making adjustments and providing compensating hearing devices for handicapping loss of hearing. It has opened to the medical profession the possibility of vast attainment in a neglected field of preventive medicine. Already the public school health program in many communities has been expanded to include the routine testing of the hearing of school children by scientifically accurate methods. This means the use of the audiometer. Several states have passed laws effectively providing for this procedure. The benefit which will follow its general adoption is incalculable. This procedure, to insure its satisfactory application, should be under the general supervision of interested qualified physicians and not be left to laymen, nurses and technicians. The situation demands the leadership of public-minded medical practitioners, especially otologists. The chief obstacle to the general use of audiometers in school health work has been the matter of expense. It should be made known that recently the cost of equipment has been materially reduced and the methods of application simplified, insuring greater accuracy and economy of time. Recently there has been made available at a low price a new, pure tone audiometer especially designed for use in schools. It is well constructed, is accurate in its performance and makes possible the testing of from thirty to sixty pupils per hour at fixed intervals of one octave from 128 to 8,192 double vibrations per second. It provides the means for detecting and measuring hearing acuity only by air conduction, thereby precluding its use for diagnosis or prescribing hearing devices. The temptation of the school nurse or technician to make a diagnosis is thus avoided. This type of audiometer will find extensive use in public schools, in college and university health services and in industrial medicine. In connection with the presentation of these instructive papers, attention should be directed to improvements recently made in hearing aids of the vacuum tube type. These have been so reduced in bulk and weight that they are now wearable like devices of the carbon microphone type. Since they afford much greater amplification than the latter, are remarkably free from distortion and intolerable internal noises and have a greater frequency range, they are especially adapted to the needs of those severely deafened persons who cannot be fitted by the carbon microphone hearing devices.

Dr. Harold A. Fletcher, San Francisco: The authors have spoken on the standardization of the audiometer. I have come more and more to use the audiometer. It is expensive and it makes the average otologist stop and think before he purchases one. I hope that the Council on Physical Therapy of the American Medical Association will soon publish a list of accepted audiometers. More otologists will buy audiometers when they are assured that they are getting an accurate instrument of precision. Drs. Jones and Knudsen mentioned the fact that otologists still must use all means of diagnosis, examination of the patient, the history and the general investigation. The use of tuning forks is still helpful. I think otologists go too far with diagnosis many times from the audiometer itself. It gives a picture of the air conduction loss in a patient with a comparative value of what tones, upper, middle or lower, are lost,

and the relative picture between them. It gives a fair idea of the bone conduction loss and it gives a basis of comparison of bone conduction loss and air conduction loss that is tolerably accurate. But we often forget the underlying pathology in the use of the audiometer and jump at conclusions from the mere curve. We should be cautious in advising the patient without taking into consideration the whole picture. I don't agree with Drs. Jones and Knudsen that one "can see an ear hear" with the electric otoscopic oscillator. The use of the oscillator is definitely helpful, but I know that when one exaggerates the movements to the drum so that they can be seen, one is not "seeing the ear hear"; one is seeing the drum membrane move under very abnormal conditions. Many times an important lesion of the ossicular chain aside from fixation of the stapes may be present and not show in the movement with the oscillator. I do not agree with Drs. Jones and Knudsen that one can make a diagnosis of otosclerosis in the case of a child at birth or at 5 years of age. Otosclerosis occurs in children younger than it was once thought, but I feel that it is impossible to make a diagnosis of otosclerosis with tests at that age. With the exception of those cases in which there is an indication to examine the vestibular apparatus, the vestibular examination has but little part in relation to the examination with the audiometer.

MR. HOWARD A. CARTER, Chicago: The Council on Physical Therapy of the American Medical Association, of which I am secretary, desires to recommend reliable and efficient apparatus for professional service. To aid the deafened, the Council is particularly interested in having on the accepted list efficient audiometers and hearing aids. A program for investigating the feasibility of fitting hearing aids by means of audiograms has been suggested in a paper by Dr. Austin Hayden. He proposes that audiograms taken by otologists in their own offices be referred to manufacturers or their representatives and from these data hearing aids will be made up according to prescription. After the hearing aid is delivered it is checked by suitable means to insure the best possible fitting. A thousand or more fittings, properly tabulated, will go far in establishing the advisability of selecting hearing aids by audiometric examination. An investigative program of this nature is indeed a step forward, and I hope that otologists will get behind the movement, thus enabling evidence of a critical nature to be accumulated as quickly as possible. As I understand it, this program is not confined to any one particular make of hearing aid but several manufacturers have been invited to participate. If the otologists do not take an active interest in fitting hearing aids, this important service will be taken over by other groups.

DR. DAVID HIGBEE, San Diego, Calif.: I realize this is a discussion about audiometry, but as Drs. Jones and Knudsen mentioned a few things that are off that subject I feel at liberty to make some statements about the diagnosis of fixed stapes. Drs. Jones and Knudsen stated that they require an oscillator to determine that the stapes is fixed or movable. Of course, that means that the membrana tympani must be intact or the oscillator would not alter its position. If a person shows a normal drum membrane and has normal bone conduction and a negative Rinne test, it certainly must indicate that the stapes is fixed. Bone conduction cannot be relied on as a certain guide to knowledge of the perception apparatus. Sometimes patients with perceptive deafness are seen who are Rinne negative. Guild has shown the pathologic condition which accounts for this phenomenon.

DR. ISAAC H. JONES, Los Angeles: Dr. Higbee and Dr. Fletcher feel that it is possible to "make a diagnosis without so much apparatus." At our recent state meeting, Dr. George Hosford showed us pictures of his office equipment in order to give his concept of a thorough study of the eye; we were all impressed with the enormous amount of apparatus. We know that many of our ophthalmologic friends spend many thousands of dollars for apparatus in order to do the best work possible; so is it not advisable for us to spend a few hundred dollars for a turning chair, an oscillator and an audiometer in a sound-proof booth in order that we also may do the best work possible? To be sure, the oscillator with the electric otoscope cannot enable one to "see the cochlea hear"; but it does enable the otologist to make a careful study of the mobility of the drum membrane and the hammer handle. It does not give direct information regarding the joint of the malleus and incus, but an arthritis of that joint would probably not permit normal mobility of the hammer. For the past twenty years we have seen several cases in which we made a clinical diagnosis of arthritis of ossicular joints, although we have no histologic evidence. With a smile, we have always said that when so many thousands of people are killed by automobiles, isn't it strange that not one of these cases has come to autopsy? However, we have no doubt that arthritis of the ossicles does occur and we suggest that all might bear this in mind in studies of lesions of the conductive mechanism. In brief, we believe in precision measurements of the ear and consider that every possible means should be used to secure the fullest information about our patients.

EXPERIMENTAL POLIOMYELITIS BY THE TONSILLOPHARYNGEAL ROUTE

WITH SPECIAL REFERENCE TO THE INFLUENCE OF TONSILLECTOMY ON THE DEVELOPMENT OF BULBAR POLIOMYELITIS

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The purpose of this communication is to present evidence (1) that the tonsillopharyngeal region is more highly sensitive to injections of poliomyelitis virus than are certain other regions of the body (e. g. the abdominal cutaneous or subcutaneous tissues) and (2) that the disease which results from infection by the tonsillopharyngeal route is, with few exceptions, bulbar or bulbospinal in type and different in its clinical course from that which follows nasal instillation of the virus. The present investigation was prompted by several clinical reports of cases of bulbar poliomyelitis following within a relatively short time operations of tonsillectomy and adenoidectomy. Ayer [1] (1928) appears to be the first to have noted the development of bulbar poliomyelitis in nine individuals within five to ten days after tonsillectomy. In 1929 Aycock and Luther [2] reported that, of thirty-six cases of poliomyelitis with a history of tonsillectomy within one year, the disease had developed in sixteen (eleven of which were of the bulbar form) from seven to eighteen days after operation, while there were no cases under seven days and none from the eighteenth to the thirtieth day. Silverman [3] observed five cases, in four of which there was palatal paralysis and in one weakness of the neck muscles, which occurred from nine to nineteen days after operation. In the 1935 outbreak in New York City, Fischer and Stillerman [4] found ten patients (among 686 cases) who had their tonsils and adenoids removed within a month of the onset of poliomyelitis. In eight of these ten the disease developed between the tenth and twelfth days after operation and in the other two on the sixteenth and twenty-second days; six of the ten patients had the bulbar or encephalitic form of the disease. During a small outbreak in 1937 Stillerman and

From the Laboratories of the Rockefeller Institute for Medical Research.

1. Ayer, W. D.: Poliomyelitis, Proc. Internat. Assembly of the Inter-State Post-Graduate Medical Assn. of North America, 1928, p. 319.
2. Aycock, W. L., and Luther, E. H.: Occurrence of Poliomyelitis Following Tonsillectomy, New England J. Med. **200**: 164 (Jan. 24) 1929.
3. Silverman, A. C.: Acute Poliomyelitis in Syracuse, New York: Clinical Analysis of Five Successive Outbreaks from 1922 to 1929, with Special Reference to Epidemiology and Treatment with Serum, Am. J. Dis. Child. **41**: 829 (April) 1931.
4. Fischer, A. E., and Stillerman, Maxwell: Acute Anterior Poliomyelitis in New York in 1935: A Review of 686 Cases, Am. J. Dis. Child. **54**: 984 (Nov.) 1937.

Fischer [5] found three cases in which there was a history of tonsillectomy during the month preceding the illness among fifty-two poliomyelitis patients; all three had the bulbar form of the disease and the interval between operation and onset was fourteen days in two and twenty-one days in the third. While a large number of children are ordinarily submitted to tonsillectomy and adenoidectomy during the summer months and the occurrence of poliomyelitis among some of them may perhaps not be unexpected, it is the relatively high incidence of bulbar involvement among them that leads one to suspect that these operations may perhaps not only have favored the development of poliomyelitis but also influenced the special localization of the disease.

Experimentally there has been very little work done heretofore on the tonsils or pharynx as a route of poliomyelitis virus infection. In 1911 Landsteiner, Levaditi and Danulesco [6] reported that submucous injection into the tonsillar area of a monkey resulted in poliomyelitis. Levaditi and Danulesco [7] showed that painting or rubbing the tonsils of three monkeys with virus failed to induce the disease, while application of the same virus to the nasal mucosa was followed by typical poliomyelitis. It is a common observation that, when virus is instilled intranasally in the amounts ordinarily used in rhesus monkeys, most of it runs down into the pharynx and mouth. The almost regular failure of the disease to develop following nasal instillation in monkeys whose olfactory pathways had been interrupted [8] suggests therefore that contamination of the intact structures of the pharynx and mouth does not supply a suitable site for the entry of the virus.

It appeared desirable, therefore, to investigate (1) whether the presence of an open wound such as would follow a tonsillectomy operation might open a new portal of entry for the virus and (2) to determine the ease with which poliomyelitis could be induced by injecting the virus into the tonsillopharyngeal region and whether or not the disease so produced would be different from that which follows other modes of inoculation. It was clear from the beginning that, working with virus in the pharynx and mouth, it would be very easy to contaminate the nasal mucosa and that, unless some method of barring the olfactory pathway as a portal of entry for the virus was employed, the results might be confusing or difficult to interpret. Since the 1 per cent zinc sulfate nasal spray has proved effective in our hands,[9] as in those of Schultz and Gebhardt,[10] in preventing poliomyelitis in almost all monkeys receiving virus by nasal instillation, this method was chosen to close the olfactory pathway while studying the effect of tonsillectomy as a possible means of opening a new portal of entry for the virus. Histologic examination of the olfactory bulbs [11] of monkeys succumbing to the disease provided another means for ascertaining whether or not the virus had reached the central nervous system by a pathway other than the olfactory.

Do Tonsillectomy Wounds Open a Portal of Entry for Virus Administered by Spraying, Swabbing or Nasal Instillation?—Two series of experiments were conducted in an attempt to obtain an answer to this question. In the first series four Macacus rhesus monkeys were given a nasal spray of 1 per cent zinc sulfate ($ZnSO_4.1H_2O$), thirty bulb compressions from a De Vilbiss atomizer for each nostril, once a day for two days. Two days after the last spray the palatine tonsils were removed by dissection under ether anesthesia. (It may be stated here that the tissue removed had the same histologic structure as the human palatine tonsil, although for the purpose of these experiments the presence of the operative wound was the essential factor.) Within one hour of the operation 1 cc. of 5 per cent virus suspension was instilled into each nostril (virus entered throat and mouth) and the same dose was repeated four hours later. Employing pooled M. V. virus, glycerolated for not longer than one month, this procedure has led to the development of poliomyelitis in practically all control monkeys (over 100) in the past two years; [12] three control animals given the same virus suspension developed poliomyelitis. Two of the zinc sulfate–treated and tonsillectomized monkeys received additional amounts of virus—3 cc. sprayed onto the wounds at each nasal instillation. None of the four treated animals, however, developed poliomyelitis and daily temperatures for a month revealed no fever.

In the second series four monkeys received the same zinc sulfate nasal spray as in the preceding experiment. The operation was performed twenty-four hours after the last spraying and differed from the preceding one in that the operative field was flooded with virus in order that the instruments might grasp and cut through contaminated tissue. After the removal of each tonsil and the cessation of bleeding, thick virus-containing tissue (sediment from 5 per cent virus suspension) was swabbed into the wound. Before the monkey recovered from the anesthesia, 3 cc. of 5 per cent virus suspension was sprayed into the throat. On the afternoon of the same day, and twice a day during the following two days, each monkey was again sprayed with 4 cc. of virus. None of these four animals exhibited any signs of disease; in two control monkeys receiving the usual nasal instillation with this virus suspension poliomyelitis developed.

That the monkeys used in these two experiments were not resistant animals to begin with and had acquired no immunity as a result of the repeated virus sprays is evident from the fact that they succumbed with typical poliomyelitis following nasal instillation of the virus after the effect of the zinc sulfate had disappeared.[13] It seemed, therefore, that in monkeys the wounds created in the oropharynx by tonsillectomy failed to establish a portal of entry for poliomyelitis virus (M. V. strain) applied by swabbing, spraying or nasal instillation when the olfactory pathways were blocked by zinc sulfate nasal sprays prior to operation.

5. Stillerman, M., and Fischer, A. E.: Acute Bulbar Poliomyelitis Following Recent Tonsillectomy and Adenoidectomy, to be published. Personal communication to the author.

6. Landsteiner, K.; Levaditi, C., and Danulesco, V.: Presence du virus de la poliomyélite dans l'amygdale de singes paralysés et son elimination par le mucus nasal, Compt. rend. Soc. de biol. **71**: 558, 1911.

7. Levaditi, C., and Danulesco, V.: Conditions qui president à la transmission de la poliomyelite, Compt. rend. Soc. de biol. **73**: 606, 1912.

8. Brodie, M., and Elvidge, A. R.: The Portal of Entry and Transmission of the Virus of Poliomyelitis, Science **79**: 235 (March 9) 1934. Schultz, E. W., and Gebhardt, L. P.: Olfactory Tract and Poliomyelitis, Proc. Soc. Exper. Biol. & Med. **31**: 728 (March) 1934. Leonette, E. H., and Hudson, N. P.: Relation of Olfactory Tracts to Intravenous Route of Infection in Experimental Poliomyelitis, ibid. **32**: 1444 (June) 1935. Howe, H. A., and Eckr, R. S.: Experimental Poliomyelitis Without Paralysis, ibid. **37**: 125 (Oct.) 1937.

9. Olitsky, P. K., and Sabin, A. B.: Comparative Effectiveness of Various Chemical Sprays in Protecting Monkeys Against Nasally Instilled Poliomyelitis Virus, Proc. Soc. Exper. Biol. & Med. **36**: 532 (May) 1937. Sabin and Olitsky.[9]

10. Schultz, E. W., and Gebhardt, L. P.: Zinc Sulfate as a Chemoprophylactic Agent in Experimental Poliomyelitis, Proc. Soc. Exper. Biol. & Med. **35**: 524 (Jan.) 1937; Zinc Sulfate Prophylaxis in Poliomyelitis, J. A. M. A. **108**: 2182 (June 26), 1937.

11. Sabin, A. B., and Olitsky, P. K.: The Olfactory Bulbs in Experimental Poliomyelitis: Their Pathologic Condition as an Indicator of the Portal of Entry of the Virus, J. A. M. A. **108**: 21 (Jan. 2), 1937.

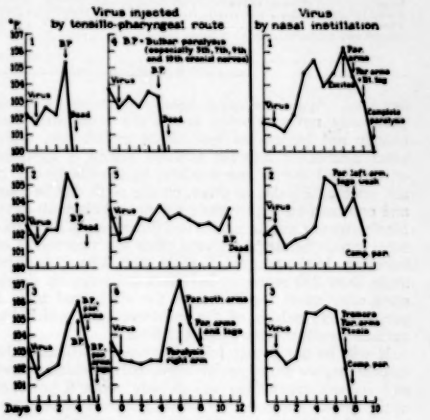
12. Sabin, A. B., and Olitsky, P. K.: Fate of Nasally Instilled Poliomyelitis Virus in Normal and Convalescent Monkeys with Special Reference to the Problem of Host to Host Transmission, J. Exper. Med. **68**: 39 (July), 1938.

13. Sabin, A. B., and Olitsky, P. K.: Mode of Action of Zinc Sulfate Spray in Preventing Infection with Nasally Instilled Poliomyelitis Virus, J. Bact. **35**: 44 (Jan.) 1938.

Does the Deposition of Virus Within the Tissues of the Tonsillopharyngeal Region (as by Injection) Lead to the Development of Poliomyelitis?—The preceding experiments emphasized again that in the monkey the olfactory mucosa is the only known peripheral tissue which by mere transitory [12] contact of its surface with the virus of poliomyelitis can permit it to invade the central nervous system. When relatively large amounts of virus are deposited within certain tissues, as by subcutaneous or intracutaneous injection, the disease may be induced in a varying, though usually small, number of monkeys. The chief purpose of subsequent experiments was to determine (*a*) whether injection into the tonsillopharyngeal region of amounts of virus usually employed for nasal instillation would give rise to poliomyelitis with any degree of frequency, (*b*) whether the disease so induced would be different from that following nasal instillation of virus, and (*c*) how inoculation by the tonsillopharyngeal route compared with injections of identical amounts of the same virus by the subcutaneous and intracutaneous routes.

In the first experiment of this series six monkeys received zinc sulfate nasal sprays as described before. Three days after the last spray the virus was administered to three monkeys by nasal instillation (1 cc. of 5 per cent suspension in each nostril on two occasions) and to the other three by injection of 1 cc. of the 10 per cent suspension into each tonsillar region. The latter inoculation was usually performed by grasping the anterior pillar of the fauces to evert the palatine tonsil, into which the needle was inserted, infiltrating the tonsil and surrounding tissues as the needle was being thrust deeply as far as the bone. Three normal monkeys which received virus intranasally for control developed poliomyelitis. Of the zinc sulfate treated animals those receiving virus by nasal instillation remained well, while poliomyelitis developed in two of the three in which virus was inoculated into the tonsillopharyngeal region; one of these two had the distinct bulbar form including aphonia and paralysis of the face and of the muscles of mastication, while in the other the first sign was head drop, which was quickly followed by flaccid paralysis of the upper extremities. In the following experiment poliomyelitis developed in four of six zinc sulfate treated monkeys inoculated with 1 cc. of 10 per cent virus suspension into each tonsillar region, three of these being of the bulbar type; six zinc sulfate treated monkeys which were given the same amounts of the same virus suspension subcutaneously in the right and left lower abdominal quadrants remained well. In the next series the same amount of virus was injected intracutaneously (in ten piqures on the abdominal skin) and into the tonsillopharyngeal region of normal monkeys, i. e. without any preliminary chemical spraying of the nasal mucosa; the six monkeys injected intracutaneously remained entirely well, while poliomyelitis developed in all six of the tonsillopharyngeal group, five of them having the typical bulbar disease. In the same experiment there were five monkeys which, having had zinc sulfate nasal sprays from one to three months before and having resisted virus by nasal instillation or pharyngeal spray, were inoculated with 1 cc. of 10 per cent virus suspension in each tonsillar region; poliomyelitis developed in four of these five, all of the bulbar type. In one of the experiments it was found that, when 0.2 cc. (instead of 1 cc.) of the virus suspension was injected superficially into the tonsillar area of six monkeys, all remained well. In another group of six monkeys which received 0.2 cc. into each tonsillar area, tonsillectomy was performed immediately after injection to determine whether the trauma and cutting through the virus-containing tissue would facilitate the development of poliomyelitis; all of these remained well. In a similar group of three, however, in which the tonsillectomy was followed by swabbing of the wounds with virus tissue and subsequent sprays of 10 per cent virus suspension into the throat, one animal acquired typical bulbar poliomyelitis (including aphonia, impaired deglutition and salivation) on the fourth and died on the fifth day. One cannot tell here whether any of the special procedures were responsible or whether in an occasional monkey even 0.2 cc. of virus may produce the disease, in spite of the fact that most of it was almost immediately removed during the tonsillectomy.

Altogether there were twenty monkeys which received injections of 1 cc. of 10 per cent virus suspension into each tonsillar region; poliomyelitis developed in sixteen of these (80 per cent) and among them there were thirteen cases of the bulbar type. None of the twelve monkeys which received injections of the same amounts of virus intracutaneously or subcutaneously (abdominal region) exhibited any signs of disease. It is, of course, known that an occasional monkey receiving subcutaneous injections of this strain of the virus (particularly with large amounts) acquires poliomyelitis, but the simultaneous tests in the present study show rather conclusively how very much more susceptible is the tonsillopharyngeal region. It has been stated [14] that there are certain strains of the virus which, early after their isolation from human beings, are somewhat more infective by the intracutaneous route than is the M. V. strain which was used in these experiments, and it is quite possible that they might be more highly infective also by the tonsillopharyngeal route.



Clinical course of experimental poliomyelitis in monkeys.

Clinical Course of Disease Following Nasal Instillation Compared with That Induced by Tonsillopharyngeal Injection of the Virus.—A most striking and practically constant manifestation of the disease induced

14. Trask, J. D., and Paul, J. R.: The Skin Infectivity of Poliomyelitis Virus, Science **87**: 44 (Jan. 14) 1938.

by nasal instillation of the virus is that the first rise in temperature occurs at least three to five days before the first appearance of nervous signs. The temperature then either remains elevated or drops considerably (sometimes practically to normal) within a day or two and usually rises again before the onset of paralysis (dromedary curve). After injection of the virus into the tonsillopharyngeal region, however, the course of events is quite different: among seventeen such monkeys in which poliomyelitis developed there were four in which no rise in temperature was observed, six in which fever and paralysis appeared on the same day, and seven in which the rise of temperature preceded paralysis by one day. Again following nasal instillation, paralysis practically never appears before the sixth day, and usually not before the seventh or eighth day, while after inoculation into the tonsillar region it appeared on the third day in one monkey, on the fourth day in six, on the fifth day in three, on the sixth day in four, and one each on the seventh, eighth and eleventh days. Furthermore there was a distinct difference in the structures which became paralyzed after the two routes of infection. In the past two to three years I have observed more than 250 monkeys in which poliomyelitis developed after nasal instillation of the virus, and table 1 presents an analysis of the incidence with which the various structures were affected first.

Table 1.—*Order in Which Structures Were Affected After Nasal Instillation of Virus*

Upper extremities first	103	(41.2%)
Lower extremities first	13	(5.2%)
Upper and lower extremities practically simultaneously	118	(47.2%)
Facial paralysis first	7	(2.8%)
Ptosis first	7	(2.8%)
Respiratory failure (bulbar ?)	2	(0.8%)
Total	250	monkeys

It will be noted that following nasal instillation the disease begins with cranial nerve palsy (chiefly third and seventh cranial nerves) in only about 6 per cent of the cases. The complete bulbar picture with aphonia, impaired deglutition, salivation or paralysis of the muscles of mastication was not observed even once, although two monkeys died apparently of respiratory failure or at least without the appearance of any observable paralysis and with histologic changes predominantly at levels above the spinal cord. After tonsillopharyngeal injection of the virus the picture was quite different (table 2).

To illustrate the sequence of events in monkeys receiving virus by injection into the tonsillar region, several protocols will be abstracted:

Monkey 1.—The temperature was normal (from 101.8 to 102.7 F.) and the animal appeared entirely well for two days after injection. On the morning of the third day the temperature was 105.1; there were weakness of the facial muscles and the muscles of mastication, salivation, and a peculiar cry; the head was erect and the extremities were strong. In the afternoon of the same day the temperature was 105.2; there were complete aphonia with obstructed respiration, impaired deglutition, salivation, complete bilateral facial paralysis and complete paralysis of the muscles of mastication; the sensory fifth nerve, the eyes and the tongue were normal; there was head drop to the left. The upper and lower extremities were strong. On the fourth day at 9 a. m. the monkey was prostrate with a temperature of 98 and labored respiration; it died one hour later.

Monkey 2.—The temperature was normal (from 102 to 103.5 F.) and the animal was well for the first two days. On the third day it was 107 in the forenoon and 106.2 in the afternoon but there were no detectable nervous signs. On the fourth day the temperature was 104.7 and there were incomplete aphonia, paralysis of the muscles of mastication, partial head drop and complete paralysis of the right arm; involvement of the facial muscles and deglutition were questionable. On the fifth day the temperature was 99; there were complete aphonia and inability to swallow liquids or solids, and paralysis of the muscles of mastication. The facial muscles were weak, the tongue was normal and there were complete head drop and flaccid paralysis of the upper and lower extremities. The monkey was killed at this stage for study of its nervous system.

Monkey 3.—The temperature was normal (from 101.7 to 103.3 F.) for the first five days. On the sixth day it was 106.3 and there were complete right facial paralysis and no other nervous signs. On the seventh day the temperature was 103.5 and there were right facial paralysis, aphonia, head drop, and paralysis of all extremities; the muscles of mastication were normal, and deglutition and tongue movement were questionable; this monkey was killed in the afternoon of the same day (the temperature then was 101.5 F.) for study of the nervous system.

Monkey 4.—The temperature was normal (from 102.2 to 102.5 F.) for the first four days and the temperature was 105.5 but the monkey was otherwise well on the fifth day. On the sixth day the temperature was 107.3; there was paralysis of the right arm but no other nervous signs. On the seventh day the temperature was 104.8; both arms were paralyzed. On the eighth day the temperature was 103.4; there was paralysis of the arms and legs but no other involvement. The animal was killed.

Monkey 5.—The temperature was normal (from 102.7 to 103.5 F.) and the animal was well for the first three days. On the morning of the fourth day the temperature was 103.2 and there were salivation, incomplete aphonia, paralysis of the muscles of mastication and complete right facial paralysis, deglutition was questionably impaired, the tongue was normal, there was head drop to the right with inability to raise the left arm above 180 degrees, and the lower extremities were uninvolved and strong. In the afternoon of the same day the temperature was 101.1, the aphonia and head drop had become complete, the facial paralysis was bilateral and there were distinct nystagmus and partial paralysis of both arms, the legs still being strong. The animal was found dead on the morning of the fifth day.

Table 2.—*Order in Which Structures Were Affected After Tonsillopharyngeal Injection of Virus*

Bulbar paralysis first (i. e., aphonia, impaired deglutition, paralysis of muscles of mastication, with or without facial, head drop or other paralyses)	13	(76.5%)
Head drop or paralysis of upper extremities or both, first (these never showed bulbar signs)	3	(17.6%)
Facial paralysis first	1	(5.9%)
Lower extremities first	0	
Total	17	monkeys

Monkey 6.—The temperature was normal (from 101.7 to 103.7 F.) and the monkey was well for ten days after injection. On the eleventh day the temperature was 103.6 and there were incomplete aphonia with difficult respiration, salivation with inability to swallow solids or liquids, bilateral facial paralysis and paralysis of the muscles of mastication, the tongue was normal, and there was head drop with complete paralysis of the right arm and inability to raise the left one above 180 degrees. The legs were uninvolved and strong. The monkey was found dead on the morning of the twelfth day.

The difference in the clinical picture of the disease induced by nasal instillation and by tonsillopharyngeal injection of the virus is exactly what one would expect on the basis of the probable progression of the virus from each site. Faber and Gebhardt [15] have already

15. Faber, H. K., and Gebhardt, L. P.: Localizations of the Virus of Poliomyelitis in the Central Nervous System During the Preparalytic Period, After Intranasal Instillation, J. Exper. Med. 57:933 (June) 1933.

shown by subinoculation experiments that nasally instilled virus involves progressively the olfactory bulbs, hypothalamus, thalamus and other higher centers before it reaches the spinal cord and gives rise to paralytic signs. In as yet unpublished studies I have observed neuronal lesions progressively in the olfactory bulbs, the region of the anterior perforated space, hypothalamus, thalamus and midbrain (especially substantia nigra) of such monkeys, and it is more than probable that the three to five day period of fever preceding the onset of paralysis is a reflection of the progressive involvement of at least some of these higher centers. After tonsillopharyngeal injection, however, the clinical picture indicates that in most if not all of the monkeys the virus that enters along the nerves supplying the region comes into immediate contact with the cranial nerve nuclei, the involvement of which leads to the typical bulbar form of the disease. Histologic studies have not yet been completed, but it is already evident that extensive lesions are present in many of the cranial nerve nuclei in the medulla and that the olfactory bulbs which are constantly involved following nasal instillation [11] were, with one exception referred to later, free from lesions.

Test for Virus in the Olfactory Bulbs and Nasal Mucosa of Monkeys Infected by the Tonsillopharyngeal Route.—In a previous study [12] it was found that, when infection occurs after nasal instillation, virus could be demonstrated in the olfactory bulbs from the third day to the termination of the disease, even though the nasal mucosa was only slightly infective and for a very short time early in the disease. The statement is commonly found in the literature that the nasal mucosa of the monkey is not only a good portal of entry for the virus but also a place for its exit. It is obvious that if the latter is generally true one cannot use the finding of virus in the human nasal secretions or mucosa as a point in favor of that region being the natural portal of entry. It appears, however, that the few positive observations on which the assumption of its nasal exit is based were obtained in monkeys that received the virus intracranially and that the results, therefore, might not be the same when the virus had invaded the central nervous system by way of certain peripheral nerves. Furthermore, it was desirable to determine to what extent the presence or absence of virus (as well as lesions) in the olfactory bulbs could be used as an index of whether or not the olfactory pathway had been used for invasion of the central nervous system, i. e. whether or not virus having entered some medullary nucleus would spread as far as the olfactory bulbs by the time the monkey died or was prostrate.

In the first series of tests there were four monkeys, all of which had received zinc sulfate nasal sprays before tonsillopharyngeal injection of the virus. Three of these had the bulbar type of the disease and the fourth had only paralysis of the extremities; one had died within twenty-four hours of the onset of paralysis, and the other three were killed when nearly prostrate, one, two and three days respectively after the onset of paralysis. Both bulbs were removed from each monkey with special precautions. A piece of each was sectioned and the rest ground in salt solution, and the entire suspension injected intracranially into a monkey. Neither a lesion nor virus was found in the olfactory bulbs of any of these monkeys.

In the second series of tests there were four monkeys which received no preliminary treatment of any kind before tonsillopharyngeal injection of the virus. All had bulbar poliomyelitis. Two died within twenty-four hours, and the other two were killed when nearly prostrate on the third day after the onset of paralysis. The olfactory bulbs were studied as before, and in addition

TABLE 3.—*Summary of Experiments*

Experiment	Preliminary Treatment	Mode of Experimental Infection	No. of Monkeys Used	Total No. Developed Poliomyelitis	Number with Bulbar Signs
a	1% zinc sulfate nasal spray for 2 days before bilateral tonsillectomy	Nasal instillation after tonsillectomy with subsequent sprays of 10% virus into throat	4	0	—
	None (virus controls)	Nasal instillation	3	3	0
b	1% zinc sulfate nasal spray for 2 days before bilateral tonsillectomy	10% virus sprayed into throat before, immediately after, and for 3 days after tonsillectomy; tonsillectomy wounds swabbed with thick virus tissue	4	0	—
	None (virus controls)	Nasal instillation	2	2	0
c	1% zinc sulfate nasal spray for 2 days before virus	Injected by tonsillopharyngeal route; 1 cc. 10% virus on each side	3	2	1
		Nasal instillation	3	0	—
	None (virus controls)	Nasal instillation	3	3	0
d	1% zinc sulfate nasal spray for 2 days before virus	Subcutaneous injection; 1 cc. 10% virus suspension into right and left lower abdominal quadrants	6	0	—
		Injected by tonsillopharyngeal route; 1 cc. 10% virus on each side	6	4	3
		0.2 cc. 10% virus injected into each tonsillar area	6	0	—
		0.2 cc. 10% virus injected into each tonsillar area, followed immediately by tonsillectomy	6	0	—
		0.2 cc. 10% virus injected into each tonsillar area, followed immediately by tonsillectomy, swabbing of wounds with virus tissue, and subsequent sprays of 10% virus into throat for 3 days	3	1	1
e	None	Intracutaneous injection; 2 cc. 10% virus in 10 piqûres in abdominal skin	6	0	—
		Injected by tonsillopharyngeal route; 1 cc. 10% virus on each side	6	6	5
	1% zinc sulfate nasal spray followed by virus instilled into the nose or sprayed into throat 1 to 3 mo. before present experiment; none of the monkeys had any signs of disease	Injected by tonsillopharyngeal route; 1 cc 10% virus on each side	5	4	4

the entire nasal mucosa of each monkey was tested for virus. No virus was found in the nasal mucosa of any of these animals, and the olfactory bulbs of three of them contained neither virus nor lesions. The olfactory bulbs of the fourth monkey (paralysis for three days) contained the virus, and microscopic examination

revealed no lesions in one bulb while in the other there was evidence of the loss of a few mitral cells with invasion of polymorphonuclear leukocytes in their places; this was not associated with any meningeal or perivascular reaction. In view of the fact that this animal had no preliminary zinc sulfate nasal spray and because paralysis had been present for at least three days, two possible explanations may be advanced: (1) that in this case there was contamination of the olfactory mucosa, with the subsequent involvement of a few mitral cells (the failure to find virus in the nasal mucosa of this monkey cannot be held against this possibility) and (2) that, owing to the relatively long duration, the virus had spread from the medulla to one of the olfactory bulbs. At any rate, it would appear that the elimination of virus on the nasal mucosa in an animal that has succumbed to infection by another peripheral route is either rare or unlikely and that the failure to detect virus in the olfactory bulbs of at least seven of the eight monkeys tested is in good agreement with the other evidence that the virus did not invade the central nervous system by the olfactory pathway.

COMMENT

The evidence presented in this communication shows conclusively that, while mere transitory contact between the normal or injured pharynx or tonsils of monkeys is not enough to produce poliomyelitis, it is possible to infect these animals when the virus in quantities of from 100 to 1,000 minimal cerebral infective doses is injected into the tonsillopharyngeal region and that this region is for some reason more sensitive than, for example, the abdominal cutaneous or subcutaneous tissue. The high incidence of the bulbar type of the disease among these monkeys, along with the other evidence that the virus did not produce the infection by invasion along the olfactory pathway, indicates that after tonsillopharyngeal injection the virus progresses along the local peripheral nerves. The high incidence of the bulbar form of the disease among the cases of human post-tonsillectomy poliomyelitis is what one would expect, therefore, if the infection occurred from the throat. If the virus in the human being behaved as it does in the monkey (and there is no definite evidence that such is the case), one would expect that for the development of post-tonsillectomy poliomyelitis the virus would have to be present in the secretions or in the tonsils during the operation and that infection would be facilitated by any procedure involving injections or postoperative suturing. That poliomyelitis virus can occur in the upper respiratory secretions and tonsils of apparently healthy human beings is already known,[16] and, although it is not yet clear whether or not the virus is more prevalent during the summer and early autumn than at other times of the year, it ought to be considered whether or not the season of the high incidence of poliomyelitis is a favorable period for nonemergency operations about the throat and mouth.[17]

Sixty-Sixth Street and York Avenue.

16. Flexner, Simon; Clark, P. F., and Fraser, F. R.: Epidemic Poliomyelitis: Fourteenth Note: Passive Human Carriage of the Virus of Poliomyelitis, J. A. M. A. **80**:201 (Jan. 18) 1913. Taylor, E., and Amoss, H. L.: Carriage of the Virus of Poliomyelitis with Subsequent Development of the Infection, J. Exper. Med. **26**:745 (Nov.) 1917. Kramer, S. D.: Detection of a Healthy Carrier of Virus of Poliomyelitis Without History of Contact, Proc. Soc. Exper. Biol. & Med. **33**:1165 (April) 1935.

17. Attention may be called here to a recent report (Gard, S.: Nouvelles recherches sur l'épidemiologie de la poliomyelite, Office international d'hygiène publique **30**:933 [May] 1938) of two cases of paralytic poliomyelitis which followed the extraction of teeth (seven teeth in one case and ten in the other) within six and ten days respectively.

Clinical Notes, Suggestions and New Instruments

LARGE RENAL CALCULUS

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In a review of the literature, Kreutzmann[1] of San Francisco lists only eight cases in which single renal calculi weighing more than 300 Gm. were removed. He found that the largest renal calculi the human body is capable of producing have been found at autopsy, at which stones have been discovered weighing from 1,500 to 2,000 Gm. The largest stone in this series was removed by Mylvaganan of England and weighed 1,440 Gm. To this series he adds his case with the successful removal of a solitary stone weighing 650 Gm. with the kidney substance included. Waterworth[2] removed a renal calculus weighing 1,100 Gm. only to have the patient die five and a half months later of a fungating carcinoma at the operative site, which had been found at operation to originate in the renal pelvis.

REPORT OF CASE

History.—J. E. F., a white man, aged 55, a merchant, admitted to Emory University Hospital Dec. 12, 1936, complained of pain in the left flank. The patient gave a history of having passed a stone a month since he was 3 years of age. These hard yellow stones would soon become friable and crumble to dust when exposed to air. The passage of a stone was invariably preceded by colicky pain in the left flank, and occasionally by bloody urine. In 1908 he passed the largest stone. It was the size of a "field pea," and he required medical attention at that time. He was advised to have the kidney removed but he refused operation. Stones had continued to come at monthly intervals, and their physical characteristics remained unchanged. Although he had continued to work almost without interruption, he stated that a dull aching pain in the left flank had been present for many years. Until of late he had been able to obtain relief at night by sleeping on his left side. In the last two years he had lost 25 pounds (11 Kg.) and for the past three weeks the pain had been increasing in severity. He stated that there was no nocturia except during dysuria accompanying the passage of a stone.

About three years before admission he began to suffer from a "burning" sensation beneath the sternum with periods of freedom from discomfort of as long as two or three months. Sodium bicarbonate was taken for relief of discomfort, which was usually at night and about two hours following meals. There was no hematemesis or tarry stools.

Examination.—The patient was obese, weighing 190 pounds (86 Kg.). The blood pressure was 140 systolic, 88 diastolic. Physical examination was negative except that there was generalized tenderness on the left side of the abdomen. On palpation a hard rounded smooth mass protruded from under the left costal margin to a level of 3 cm. below the umbilicus and as far medially as the parasternal line. The mass descended slightly with inspiration but could not be moved from side to side. There was resistance at the left costovertebral angle. The smooth edge of the liver was palpable for 2 cm. below the right costal margin in the midclavicular line.

The blood count showed a slight secondary anemia and 5 per cent eosinophils. The latter was found to be constant on repeated counts. Chemical analysis of the blood was negative. Urinalysis revealed specific gravity 1.016, reaction acid, albumin 1 plus; centrifuged and stained, it showed many pus cells and many organisms of varied structure.

The vesical mucosa had a granular appearance but was otherwise normal. When the left ureter was catheterized with a No. 5 F. catheter an obstruction was met at 28 cm. A yellow cloudy urine dripped constantly, increasing in flow with external pressure on the left flank. A 10 cc. specimen of urine from the left kidney contained 0.1 cc. of sediment, which was

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1. Kreutzmann, H. A.: Large Renal Calculus: Report of a Case, Am. J. Surg. **5**:360 (Oct.) 1928.

2. Waterworth, S. J.: Giant Renal Calculus: Carcinoma of the Kidney Pelvis: Report of a Case, J. Urol. **39**:77 (July) 1932.

composed entirely of pus cells and no bacteria. Phenolsulfonphthalein appeared on this side as a faint trace at the end of thirty minutes. A flat roentgenogram revealed a large calcified tumor in the left upper part of the abdomen occupying the position of the left kidney. Its lateral, medial and inferior margins were smooth. The upper border was slightly irregular. It measured 15 by 17 by 13 cm. The opaque catheter in the left ureter entered or passed behind the mass. At the lower border an irregular projection suggested stone in the inferior calix. Attempts to inject the left pelvis with opaque fluid failed. The right kidney was not infected and was of normal phenolsulfonphthalein output; a pyelogram was negative.

Operation.—A left nephrectomy was performed Jan. 14, 1937, under ethylene anesthesia. An incision 30 cm. long was made in the left flank. The perinephric fat was stripped away and the lower pole of an enormous mass composed of kidney substance and stone was exposed. It was free of thick adhesions except on the anterosuperior aspect, where it adhered firmly to the peritoneum. A hard smooth stone could be palpated through the renal parenchyma, the latter being about 1.5 cm. in thickness and showing marked cystic degeneration. The kidney substance had been flattened to such an extent that it covered two thirds of the stone, while the enormously dilated extrarenal portion of the kidney pelvis covered the remaining third. Attempts to deliver the mass into the incision were of no avail, and it was decided to incise the lower pole of the kidney and deliver the stone. Delivery under this plan was more difficult than had been expected, as a good purchase could not be obtained on the stone. Finally it was shelled out, and in the process several of the formed projections in the calices were broken off. The kidney pedicle consisted of a thick fibrous mass of tissue which it was impossible to skeletonize. Kelly clamps were applied to this mass and each portion was cut and tied separately. The entire kidney was removed.

Fig. 1.—Bilateral pyelogram showing enormous calculous of left kidney and normal right kidney.

The patient's blood pressure had dropped to shock level, and 1,500 cc. of physiologic solution of sodium chloride was given intravenously while the incision was being closed. The time required for the operation was two hours and twenty minutes. The patient was given a 600 cc. transfusion of whole blood before leaving the operating room.

Postoperative Course.—Inhalations of carbon dioxide were given twice a day for three days. Twelve hours after operation the patient went into mild shock as a result of blood oozing from the incision, and another 500 cc. transfusion of whole blood was given. Immediately after operation he vomited a large amount of dark clotted blood, which he continued to do for several days. This suggested either trauma to the stomach or the presence of an old peptic ulcer, and all fluids by mouth were withheld for five days, at which time he began to take a Sippy diet. Three thousand cubic centimeters of 5 per cent solution of dextrose in distilled water was given daily during

Fig. 2.—Appearance of stone. Pieces were broken off during operation.

this period. On the second postoperative day the temperature had reached 101.4 F. and the pulse 140 per minute. Both pulse and temperature returned to normal at the end of the second day and remained so until he was dismissed from the hospital on the twenty-first postoperative day.

An x-ray examination of the upper part of the gastrointestinal tract revealed no ulcer but showed evidence of irritation of the gastric musculature. The stomach was high in the abdomen. Its lower pole dropped into the space previously occupied by the renal calculus.

PATHOLOGIC REPORT

The specimen of kidney and calculus weighed 2,265 Gm. When the operative incision in the kidney was continued upward so as to lay it open, the cortex was found to be almost destroyed and quite uneven, and the calices were markedly dilated and fused into a large saclike pelvis which covered the calculus. Microscopic examination of sections showed the glomeruli to vary considerably in size, some of them being quite small and atrophic and others completely replaced by hyaline changes. Practically all tubules showed varying degrees of albuminous degeneration with some epithelial desquamation. Other areas showed complete fibrous replacement of parenchyma. The stone alone weighed 1,565 Gm. Several fragments had a staghorn appearance and fitted into the calices of the kidney.

Chemical analysis of the stone revealed calcium, magnesium, phosphates, carbonates and a trace of sulfur and oxylates. There were no urates.

COMMENT

It is worthy of note that at the time of cystoscopic, pyelographic and functional study we found a faint trace of phenolsulfonphthalein appearing from the left kidney mass at the end of thirty minutes. This would seem to indicate that even in the presence of this enormous stone, with resultant thinning out of the cortex, the kidney was still able to secrete some

urine. That the patient was able to supply urinary constituents which go to form stones may account for its reaching this enormous size over a period of many years. The patient lived about one year after this operation in perfect health.

On Jan. 15, 1938, a year and a day after the nephrectomy, a laparotomy was done by a general surgeon, who found a malignant growth suspected to have originated in the head of the pancreas. The gallbladder was drained at that time. The patient died about four weeks after the laparotomy.

As far as we have been able to ascertain from the literature, this is the largest single renal calculus that has successfully been removed.

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AN OPERATION FOR PARALYSIS OF THE INTRINSIC MUSCLES OF THE THUMB

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The inability to oppose the thumb to the other fingers owing to paralysis of the intrinsic thenar muscles leads to "flat hand" deformity. This is primarily due to the loss of function in the musculus opponens pollicis, but the short flexor and short abductor are also concerned in the production of this deformity. For many years I have been practicing a tendon transplantation to correct the disability caused by the paralysis and to restore the function of the thumb.

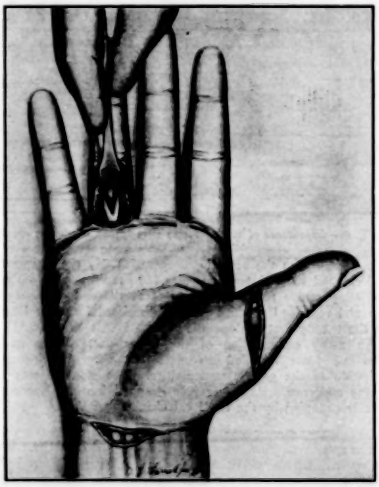

Fig. 1.—Step 2 of operation.

As the thumb had to be drawn to the medial side of the hand, I chose for transplantation the flexor sublimis of the ring finger since this would make the process of education easier.

TECHNIC OF OPERATION

Step 1.—The skin is opened through the transverse fold at the base of the ring finger. By retracting the skin distally, one can reach the insertion of the bifurcated tendon of the flexor sublimis with a tenotome, with which it is then cut through on each side.

Step 2.—The sheath of the flexor pollicis longus is opened through an incision at the deep fold proximal to the metacarpophalangeal joint of the thumb (fig. 1).

Step 3.—An incision is made in one of the transverse folds of the palmar aspect of the wrist. The cut tendon of the ring finger is then drawn out through this incision. It is passed up the sheath of the long flexor of the thumb and brought out at the incision at the metacarpophalangeal joint of the thumb (fig. 2).

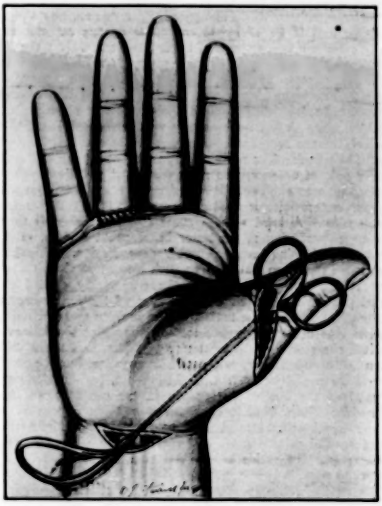

Fig. 2.—Step 3 of operation.

Fig. 3.—Step 4 of operation.

Step 4.—The attachment of the short flexor and of the opponens pollicis is next exposed by dissecting up the skin distally. One part of the bifurcated tendon of the superficial flexor of the ring finger is stitched to the attachment of the

short flexor with the first phalanx in flexion. The other part is stitched to the outer edge of the opponens pollicis with the thumb in opposition. The living suture method is employed; that is, the tendon is the stitch and is sewn into place with the author's living suture needle. This needle has a cutting point; the tendon is actually threaded in the needle and sewn into its new attachment. The tendon of the flexor sublimis may be split so as to lengthen the stitches (fig. 3). The wounds are closed and dressings applied with the thumb strapped in the position of opposition and flexion of the first phalanx. This position is maintained for about ten days, after which active movements are performed.

Fig. 4.—Thumb in opposition after operation.

Fig. 5.—Thumb in abduction after operation.

REEDUCATION

It is easy for the patient to educate himself to use the transplanted tendon, for when he attempts to flex the ring finger the thumb is drawn into opposition to that finger. The superficial flexor muscles of the little finger or of the medial finger may also be used for this operation. Figures 4 and 5 show the result of this transplantation in a typical instance of the deformity.

185 Macquarie Street.

NICOTINIC ACID IN THE TREATMENT OF PELLAGRA

REPORT IN A CASE OF MARKED DEMENTIA

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In recent months there have been quite a few references in the medical literature to the use of nicotinic acid (3-pyridine carboxylic acid) in the treatment of pellagra.[1]

Only one of these reports has stressed the fact that the patient had dementia, and it was mentioned as a mild dementia and was present only at intervals.[1b]

For that reason, it is believed that the report of a case recently observed, in which the patient is still under treatment, will be of interest. Also a comparison may be drawn between the effectiveness of the parenteral and the oral administration of nicotinic acid for pellagrous dementia, as in the case reported here the acid was administered only by the oral route, while in the one previously reported it was administered mostly by the parenteral route.

REPORT OF CASE

Mrs. M. G., aged 59, white, was first seen March 20, 1938. She was in a state of marked dementia, simulating a catatonic type of schizophrenia.[2] She complained in no way of feeling badly but rather repeatedly stated that she had never felt better in her life. Medical aid was sought because of the rather sudden change in her mental state. She carried on an incessant monologue, became quite violent at frequent intervals and would strike any one within reach or throw any object on which she could lay her hands. Questions directed to her were completely ignored.

Her past history was irrelevant except for the fact that she had suffered from endemic pellagra for the past six years. Symptoms were noted each year, beginning in the spring and continuing until cold weather. They consisted of loss of appetite, diarrhea, glossitis, drying and discoloration of the backs of the hands and insomnia. During these stages of exacerbation of symptoms she would take pills of ferrous carbonate, Fleischmann's yeast cakes and dilute hydrochloric acid, a regimen of treatment recommended six years before by an internist. As soon as the symptoms abated she would stop all forms of medication.

The present symptoms apparently began in January 1938, when she again noticed a diminution in appetite, insomnia and tingling and burning of the feet and legs as high as the knees. About this same time members of the family noticed that she was not quite normal mentally. Her condition gradually became worse, until there was a complete loss of appetite, vomiting of practically everything taken into the stomach, marked insomnia and frequent attacks of severe depression. The day she was first seen she suddenly became violent and exhibited all the signs of complete loss of the mind.

Owing to her violent mental state examination was extremely difficult. An exacerbation of pellagra was found to be present. The dorsa of both hands were very dry and red; some pigmentation from a preceding involvement was present. The tongue and buccal mucosa were slick and red. The skin over the entire body was dehydrated and very rough. Superficial sensations in the feet and legs were apparently diminished. It was impossible to determine the activity of reflexes because of the violent motions and complete lack of cooperation. The results of physical examination were otherwise negative except for observation of a slight irregularity of the pulse and a blowing systolic murmur over the base of the heart. The blood pressure was 142 systolic, 94 diastolic. An electrocardiograph was not available. Examination of the blood showed slight anemia: red cells 4,250,000, hemoglobin content 85 per cent (Sahli), and white cells 6,800: 60 per cent polymorphonuclear leukocytes, 38 per cent lymphocytes, 2 per cent eosinophils. The specimen of urine submitted for analysis was highly colored, acid, with a specific gravity of 1.032, albumin 2 plus and no sugar; under the microscope pus cells, red blood cells and coarsely and finely granular casts were observed.

An attempt was made to institutionalize the patient in a nearby medical center but this was not successful, so treatment was begun at home and consisted of administration of liver extract and vitamin B_1. All medication and fluids were, of necessity, given parenterally. One of the barbiturates, in doses of 3 grains (0.2 Gm.), was given every three or four hours for the mental condition.

This routine was followed for seven days, during which time the patient was constantly restrained. Attempts were repeatedly made to give some fluids and food by mouth, and after the fourth day some of these were partially successful. From the fourth through the eighth day she was given about 30 Gm. of dried brewers' yeast (all that could be given) daily in addition to the other treatment.

After seven days of this treatment no improvement could be noticed. The physical signs and mental symptoms were just the same as at the beginning of treatment.

On the eighth day treatment was begun with nicotinic acid, administered orally, in doses of 100 mg. five times a day, as recommended by Spies, Cooper and Blankenhorn.[1c]

Twenty-four hours after the administration of nicotinic acid was started she asked for a drink of water, the first time she had asked for anything in nine days. Twelve hours later she would take food placed in her mouth. This was the first indication of any improvement whatever.

Forty-eight hours after the first dose there was definite improvement, both in her physical appearance and in her mental symptoms. She still talked at random and occasionally was violent, but the improvement was easily seen. She would frequently ask for water and would attempt to take all foods given her. At this time the use of liver and vitamin B was stopped, and the brewers' yeast was increased to 180 Gm. a day.

Seventy-two hours after the beginning of treatment with nicotinic acid the mucosal and cutaneous signs were practically

1. (a) Relation of Nicotinic Acid to Human Pellagra, current comment, J. A. M. A. **109**: 1203 (Oct. 9) 1937. (b) Smith, D. T.; Ruffing, J. M., and Smith, Susan Gower: Pellagra Successfully Treated with Nicotinic Acid, ibid. **109**: 2054 (Dec. 18) 1937. (c) Spies, T. D.; Cooper, Clark, and Blankenhorn, M. A.: The Use of Nicotinic Acid in the Treatment of Pellagra, ibid. **110**: 622 (Feb. 26) 1938. (d) Fouts, P. J.; Helmer, O. M.; Lepkovsky, Samuel, and Jukes, T. H.: Treatment of Human Pellagra with Nicotinic Acid, Proc. Soc. Exper. Biol. & Med. **37**: 405 (Nov.) 1937.

2. Sadler, W. S.: Theory and Practice of Psychiatry, St. Louis, The C. V. Mosby Company, 1936, p. 827.

nil, and only at infrequent intervals was there any indication of mental restlessness. She had slept well the preceding night without the aid of the barbiturates. She said she was hungry and that all foods tasted good for the first time in over two months.

On the fourth day of treatment she became perfectly rational; cutaneous signs had disappeared except for a few patches of pigmentation on the backs of the hands. At the time of this report, seven days after the administration of nicotinic acid was started, she has been rational for seventy-two hours without once exhibiting symptoms of depression or dementia.[3] Her facial expression is normal, the skin is normal except for slight patchy pigmentation, the tongue is only slightly red on the borders, and her appetite is excellent. The blood pressure, pulse and murmur are the same as at the first examination.

Examination of the blood reveals: red cells 4,550,000, hemoglobin content 94 per cent (Sahli), white cells 6,500; 60 per cent polymorphonuclear leukocytes, 40 per cent lymphocytes.

On analysis the urine is normal in appearance, acid, with a specific gravity of 1.018, no albumin and no sugar. Under the microscope occasional pus cells and casts are observed.

It is believed that in this case full credit for recovery is due to the treatment with nicotinic acid.

COMMENT

As was stated, the patient was started on a dose of 500 mg. of nicotinic acid daily in five doses of 100 mg. each. No effects of the drug were noticed which could be considered side effects or contraindications; not even the sensation of heat and redness of the skin was noticed, as is reported in most cases. To determine whether any symptoms would develop after prolonged administration, this patient was kept on a daily dose of 500 mg. until a total of 8 Gm. had been taken. Then the dose was dropped to 300 mg. daily until another 6 Gm. had been taken, making a total of 14 Gm. over a period of two months. On only two occasions were redness and warmth of the skin noticed; this condition lasted for about fifteen minutes each time and caused the patient no particular discomfort.

After the first week of the administration of nicotinic acid the patient has been on a full pellagra-preventive diet, with dried yeast (from 120 to 180 Gm. daily).

Physical examination May 22 showed that the patient was a normal healthy woman without any indications of pellagra or dementia.

From observations on this one case it appears that the toxicity, if any, of nicotinic acid is negligible. It also appears that by the use of this drug in an advanced case of pellagra there is a much better chance of placing the patient in a position to take a pellagra-preventive diet than would otherwise exist. Is it not possible that the stomatitis, intestinal cramping and diarrhea bring about a dislike for food because of the difficulty in taking it and thereby set up a vicious circle? It is not likely that any one would look on nicotinic acid as a substitute for food. In the cases so far reported it brings about a rapid abatement of symptoms, so that these patients can be placed on the proper diet.

Such recurrences could hardly be attributed to the nonspecificity of the drug. Some of these persons are alcoholic addicts who are going to take whisky even to the exclusion of necessary foods; there are others who are unable to get the proper foods because of their standard of living. Some patients will, no doubt, have relapses, it being assumed that the cause of pellagra is dietary deficiency.

SUMMARY

1. A woman with severe pellagrous dementia recovered after seven days of treatment with nicotinic acid in doses of 100 mg. five times a day.

2. Apparently a drug has been found which will greatly simplify the treatment of pellagra. Since the cost of the medication is so small, any one suffering from pellagra should be able to get it.

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3. An additional report of the use of nicotinic acid for pellagra has just appeared in THE JOURNAL. (Spies, T. D., and Aring, C. D.: The Effect of Vitamin B_1 on the Peripheral Neuritis of Pellagra, J. A. M. A. **110**: 1081 [April 2] 1938). The dementia of one of the patients discussed in this article was more marked than that of the one originally referred to[3b] but still was of much less degree than the one here reported.

Special Article

PHYSIOLOGY AND PATHOLOGY OF VITAMIN D

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This article and others recently published or to be published comprise a new series on the present status of our knowledge of the vitamins. They have been prepared under the general auspices of the Council on Pharmacy and Chemistry and the Council on Foods. The opinions expressed are those of the authors and not necessarily the opinions of either council. Reprints are not available but the articles will be published later in book form.—ED.

Vitamin D prevents or cures rickets. Until recently this factor was thought to be a single substance. The active compound formed by the irradiation of ergosterol was considered identical with the antirachitic agents present in natural products or formed in animals or foods by ultraviolet irradiation. It was found, however, that different sources of vitamin D might have different relative values, depending on whether the products were tested with rats or with chickens. It was found also that several different sterols, carefully purified, could be activated by various methods. The multiple nature of vitamin D thus became established, and Bills recently has described ten different substances which are capable of exerting a vitamin D effect. As more information becomes available regarding the chemical nature of the different forms of vitamin D, there may be afforded a clearer understanding of the physiologic and pharmacologic aspects of each active substance. At the present time, however, vitamin D can be detected only by its effect in the prevention or alleviation of rickets. Thus it happens that different sources of vitamin D have qualitatively the same effect on the animal body.

RICKETS

Rickets is a condition made manifest by defects in the calcification of growing bones. It may be recognized by roentgenologic examination of the bones or, in experimental animals, by chemical analysis of the bone ash, by histologic examination or by other methods. The court of last resort is the histologic picture of the bone.

The sequence of events in the production of normal and of rachitic bone has been epitomized by Wolbach.[1] Growth in the length of the long bones occurs by endochondral formation of bone. In the normal tibia of the growing rat, for example, the epiphysial cartilage at the upper end of the shaft is a narrow plate. This is firmly supported by bone, in the form of transverse trabeculae or a thin fenestrated plate, on the epiphysial side, and it is uniformly penetrated by capillaries on the diaphysial side. Growth occurs by the continuous proliferation of cartilage cells, which are arranged in orderly columns on the epiphysial side, and by the simultaneous degeneration of the matured cartilage cells on the diaphysial side. In the spaces left by the degeneration and disappearance of the cartilage cells there appear capillaries and bone-forming cells, or osteoblasts.

From the Department of Pediatrics of the Harvard University Medical School and the Infants' and Children's Hospitals.

1. Shohl, A. T., and Wolbach, S. B.: Rickets in Rats: XV. The Effect of Low Calcium-High Phosphorus Diets at Various Levels and Ratios upon the Production of Rickets and Tetany, J. Nutrition **11**: 275 (March) 1936.

These are responsible for the deposition of the bony matrix. The growth of bone by endochondral formation of bone, according to Wolbach, is achieved "by a continuously retreating gap in the continuity of tissues, maintained on the epiphysial side by continuous renewal of cartilage cells and on the diaphysial side repaired by vascular outgrowth comparable to repair of any defect of tissues by the process of organization or granulation tissue formation. In normal growth there presents on the diaphysial side of the narrow cartilage a continuous layer of clear or empty cartilage cells forming an almost straight line."

The first histologic evidence of rickets is the cessation of the degenerative sequences of the cartilage cells. The layer of clear cells does not form, and consequently there is no ingrowth of capillaries and osteoblasts. If the degree of rickets is slight, there is a moderate increase in the width of the epiphysial cartilage. Because the cessation of degenerative sequence in the cartilage cells does not occur simultaneously in all the affected cells, the epiphysial cartilage presents an irregular border on the diaphysial side. The width of the cartilage increases because of continued activity of the proliferative zone and the survival of cells on the diaphysial side.

After the cessation of degenerative changes in the cartilage cells of the rachitic bone, calcification of the cartilaginous matrix ceases, and osteoid material accumulates around the capillaries of the diaphysis. In advanced rickets some changes occur that are probably brought about by the pressure of weight bearing. The uncalcified cartilage of the diaphysial border often is stratified transversely in places, and the osteoid material, which is also uncalcified and which increases in amount with the duration of the dietary deficiency, becomes molded. In long-continued rickets there may be a disappearance of the cancellous bone of the diaphysis and a marked resorption of cortical bone. "The degree or severity of rickets may be recorded on the basis of the prominence of anatomical changes. Obviously two factors enter into the production of the pathological picture; the duration of the deficient diet and the degree of the deficiency." [1]

The changes in the bones in rickets result in those gross manifestations which are recognized clinically; [2] namely, enlargement of the wrists, knees and ankles, bowed legs, beading of the ribs and the rachitic rosary, Harrison's groove and craniotabes.

When vitamin D is given to rachitic animals, calcification begins again at the line of provisional calcification. The first histologic evidence of repair is the presence along the diaphysial border of degenerated cartilage cells. This effect is visible at the end of twenty-four hours and is accompanied by extensive vascular penetration within forty-eight hours. The penetration of blood vessels permits the deposition of the bone-forming salts. There is thus produced the so-called line test for healing. The mass of irregular cartilage cells becomes arranged into short, orderly, parallel columns of a few cells. Osteoid material is no longer formed. A remarkable degree of repair takes place, but for a long time the expert pathologist can detect traces of the former abnormality.

It has now become generally recognized that there is no fundamental pathologic condition in the rachitic bone which prevents its calcification. Shipley [3] reported in 1924 that slices of rachitic bone and cartilage became calcified when placed in normal blood serum. Later Shipley, Kramer and Howland [4] showed that suitable solutions of inorganic salts would bring about a similar result. This has been confirmed by Robison and Soames.[5] Further, as shown by Harris,[6] there is no reason to believe that vitamin D acts directly on bone cells to promote calcification. The action of vitamin D, instead, is so to alter the body fluids that bone salts may be incorporated into the growing bone. Rickets may be regarded as a fault in the metabolism of calcium and phosphorus. In this sense, rickets is the cause and not the result of the bony lesion.

CHEMISTRY OF CALCIUM AND PHOSPHORUS PRECIPITATION

Whatever may be the cause of the defect in metabolism which leads to rickets, the pathogenesis lies in the condition of the Ca^{++} and $(PO_4)^{---}$ in the blood serum.[7] Here is found the material available for excretion by the intestine or kidney or for deposition in bone or other tissues of the body. It has been mentioned that minerals will precipitate in rachitic cartilage in vitro either in normal serum or in properly constituted inorganic solutions. This does not imply that the formation of bone is an inorganic process. It takes place in the living cell, and the proper type of cartilage degeneration is essential to the entrance of the blood vessels. What takes place in the space between the cells is quite obscure, but certainly the proper inorganic environment is essential to deposition. It can best be expressed in physiochemical terms.[8] Only when the adequate concentration of calcium, phosphate and carbonate ions is present can precipitation of the salt take place. This complex salt is a dahllite, $n Ca_3(PO_4)_2 CaX$ in which the n varies between 2 and 3 and the X may be CO_3, OH or F. It may be regarded as a solid solution of $CaCO_3$ in $Ca_3(PO_4)_2$. The ratio of two mols of $Ca_3(PO_4)_2$ to one mol of $CaCO_3$ is practically constant for adult bone, which by analysis gives 12 per cent $CaCO_3$ and 88 per cent $Ca_3(PO_4)_2$.

By the use of a frog heart method for the determination of ionized calcium, McLean and Hastings [9] were able to show that the larger part of the serum calcium was combined with protein. Of the usual 10 mg. per hundred cubic centimeters of serum, about 4.5 mg. or 1.1 millimols is ionized. According to their calculations not over 5 per cent of the total calcium can be in diffusible nonionized form.

The composition of the salt precipitated from a solution containing Ca^{++}, $(PO_4)^{---}$ and $(CO_3)^{--}$ gradually increases in CO_2 content. Logan and Taylor [10] have shown that the solubility product varies with the amount of substrate present and that a higher concentration is necessary to initiate the formation of the precipitate than to permit its subsequent formation.

2. Hess, Alfred: Rickets, Osteomalacia and Tetany, Philadelphia, Lea & Febiger, 1929. György, Paul: Umsatz der Erdalkalien (Ca, Mg) und des Phosphats, Handb. d. norm. u. path. Physiol. **16**: 1355-1641, 1931; Rachitis und Tetanie, Berlin, Julius Springer, 1929.

3. Shipley, P. G.: Healing of Rickety Bones in Vitro, Bull. Johns Hopkins Hosp. **35**: 304 (Sept.) 1924.

4. Shipley, P. G.; Kramer, B., and Howland, J.: Calcification in Vitro, Biochem. J. **20**: 379 (no. 2) 1926.

5. Robison, Robert, and Soames, Katharine M.: Possible Significance of Hexosephosphoric Esters in Ossification: Calcification in Vitro, Biochem. J. **24**: 1922 (no. 6) 1930.

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9. McLean, F. C., and Hastings, A. B.: The State of Calcium in the Fluids of the Body: I. The Conditions Affecting the Ionization of Calcium, J. Biol. Chem. **108**: 285 (Jan.) 1935.

10. Logan and Taylor: Cited by Hastings.[8]

Thus, although the concentrations of these ions at the site of calcification are as yet unknown, the advances that have recently been made in the quantitation of Ca^{++}, $(PO_4)^{---}$ and $(CO_3)^{--}$ and the solubility product constant necessary for precipitation in bone bring chemical explanation much closer.

PHOSPHATASE

The enzyme phosphatase discovered by Robison [11] has the property of splitting organic phosphorus compounds such as hexose phosphate into inorganic phosphate. This enzyme occurs in largest amount in the cartilage but appears also in the kidney, bowel and blood serum. Just what the function of phosphatase in the serum may be is not known, for the acid soluble phosphorus is present almost entirely as inorganic phosphate. Kay [12] regards it as a "leakage" from tissues of higher content. It may deal with the correction of phosphates by way of the kidney or bowel or the metabolism within the cell. Such a liberation of phosphate may be a step in the mechanism of carbohydrate metabolism or in muscle function. Certainly, if phosphorus esters were present in bone tissue, the local increase of inorganic phosphate would be an important step in the precipitation of calcium phosphate. However the phosphatase acts, there is no question that in diseases of the bone, especially resorptive ones in which osteoblastic activity is increased, the phosphatase of the serum is increased. Such is the case in rickets. Its increase is perhaps the first definite evidence of development of the rachitic condition, antedating roentgenogram changes and alterations in the blood serum phosphate. The content is high in active rickets. When vitamin D is administered it decreases toward normal, but more slowly than the other values; the phosphatase may not reach a normal content for several months after there is evidence of healing.[13] The increase of phosphatase in low phosphorus rickets thus acts as a protective mechanism.

HYPERVITAMINOSIS D

When huge excesses of vitamin D are given, there results a definite pathologic condition called hypervitaminosis D.[14] It is an exaggerated form of the physiologic or therapeutic effect of this vitamin. The calcium and the phosphate level in the blood are raised above normal. Calcification takes place at an increased rate, so that on roentgen or histologic examination the deposition of minerals at the provisional zone of calcification is usually dense. When the dose is sufficiently large, about a thousand times the therapeutic dose, the deposition of minerals at the epiphyses is made at the expense of that in the shaft. The balances of calcium and phosphorus become negative.[15] Metastatic calcification now takes place. The organs most affected are the tubules of the kidneys, blood vessels, heart, stomach and bronchi. There is evidence of irritation and degeneration in these tissues and in the liver. Under these conditions the animals lose weight rapidly, have intense diarrhea and die in from five to fourteen days. With smaller doses death comes later or the animal survives. Animals which live show the lesions described at least six months afterward. Healing of rickets takes place with diets which are deficient in either calcium or phosphorus. Calcification is less severe and more delayed, but the degenerative changes are as severe as those found in animals fed a normal diet.

RELATION OF RICKETS TO GROWTH

Body growth and development are coordinated with, and limited by, skeletal growth. Paucity of minerals necessary for the formation of the bones retards not only the development of the skeleton but that of the entire body. Because bone salts are predominantly salts of calcium and phosphorus, it is not surprising that the ingestion, absorption, assimilation and utilization of these two elements are the principal factors which determine the development of the bone. Osborne and Mendel [16] showed that calcium or phosphorus could be the limiting factor of growth. Shohl and his collaborators [17] extended their studies to show that even with liberal additions of vitamin D to diets restricted in phosphorus, growth was limited to as much as 40 per cent of the normal.

It has long been a clinical dictum that the manifestations of rickets are proportional to the growth of the infant—"no growth, no rickets"—but from studies of experimental rickets it is obvious that the condition may be present without increase in weight or even with a decline in weight. In no case of experimental rickets is the growth as great as normal. With an otherwise adequate diet it is primarily the utilization of calcium and phosphorus which determines the rate of growth, and it is the interrelation of calcium and phosphorus and vitamin D which determines the development or the cure of rickets.

RELATION OF RICKETS TO DIET

The successful production of experimental rickets depends on the proper regulation of the calcium and phosphorus of the diet in the absence of vitamin D. In children and in some experimental animals, e. g., dogs,[18] a deficiency of vitamin D alone, without great distortion of the diet, is sufficient to produce rickets. With rats the calcium and phosphorus of the diet must be restricted or fed in unusual proportions. Complete reviews of the earlier literature may be found in the works of Goldblatt,[19] Hess,[2] György [2] and Gubner.[20] Briefly, it may be recalled that McCollum and his collaborators [21] investigated a wide variety of diets and obtained their best results with a diet of high calcium and low phosphorus content. They also reported success with low calcium and high phosphorus diets, although with these the bony lesions differed slightly from those which are found in children. When the calcium and phosphorus were about equal, they did not obtain rickets in rats. Sherman and Pappenheimer [22] and Steenbock and

11. Robison, Robert: The Significance of the Phosphoric Esters in Metabolism, Herter Lectures, New York, New York University Press, 1932.

12. Kay, H. D.: Plasma Phosphatase: Enzyme in Disease, Particularly in Bone Disease, J. Biol. Chem. **89**: 249 (Nov.) 1930.

13. Bodansky, Aaron, and Jaffe, H. L.: Phosphatase Studies; Serum Phosphatase in Diseases of Bone; Interpretation and Significance, Arch. Int. Med. **54**: 88 (July) 1934. Morris, Noah; Stevenson, Mary M.; Pedan, Olive D., and Small, Jean M. D.: The Significance of Plasma Phosphatase in the Diagnosis and Prognosis of Rickets, Arch. Dis. Childhood **12**: 45 (Feb.) 1937.

14. Shohl, A. T.; Goldblatt, Harry, and Brown, H. B.: The Pathological Effects upon Rats of Excess Irradiated Ergosterol, J. Clin. Investigation **8**: 505 (June) 1930. Harris.[5]

15. Shohl, A. T., and Brown, H. B.: Rickets in Rats: XI. The Alteration of Calcium and Phosphorus Metabolism of Normal and Ricketic Rats Produced by Irradiated Ergosterol, J. Biol. Chem. **86**: 245 (March) 1930.

16. Osborne, T. B., and Mendel, L. B.: The Inorganic Elements in Nutrition, J. Biol. Chem. **34**: 131 (April) 1918.

17. Shohl, A. T.; Brown, H. B.; Chapman, E. E.; Rose, C. S., and Saurwein, E. M.: The Evaluation of the Phosphorus Deficiency of the Rickets-Producing Diet, J. Nutrition **6**: 271 (May) 1933.

18. Mellanby, Edward: Experimental Rickets, Medical Research Council, Special Report Series, no. 61, London, His Majesty's Stat. Off., 1921. Shohl, A. T., and Bennett, H. B.: Rickets in Dogs: Metabolism of Calcium and Phosphorus, J. Biol. Chem. **70**: 633 (March) 1926.

19. Goldblatt, Harry: Die neuere Richtung der Experimentellen Rachitisforschung, Ergebn. d. allg. Path. u. path. Anat. **25**: 58, 1931.

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21. McCollum, E. V.; Simmonds, N.; Shipley, P. G., and Park, E. A.: Studies on Experimental Rickets: VIII. The Production of Rickets by Diets Low in Phosphorus and Fat-Soluble A, J. Biol. Chem. **47**: 507 (Aug.) 1921.

22. Sherman, H. C., and Pappenheimer, A. M.: Experimental Rickets in Rats: Diet Producing Rickets in White Rats, and Its Prevention by Addition of an Inorganic Salt, J. Exper. Med. **34**: 189 (Aug.) 1921.

Black [23] also used high calcium and low phosphorus diets. With a low calcium and low phosphorus diet, Korenchevsky reported that rickets was not obtained, but the same diet with added calcium salts was shown by Goldblatt [24] to cause marked rickets. Thus it became a firmly fixed idea that the rachitogenic properties of a diet depend on the imbalance or disproportion between calcium and phosphorus. Experimental diets of this type, especially the Steenbock and Black No. 2965 (which is chemically similar in composition to the McCollum No. 3143), consist of 76 per cent corn, 20 per cent gluten flour, 3 per cent calcium carbonate and 1 per cent sodium chloride. The calcium content is about 1.2 per cent and the phosphorus about 0.25 per cent. The ratio of calcium to phosphorus is from about 4:1 to 5:1. The results obtained were so satisfactory that these diets became the standard rations for experimental production of rickets and also for the vitamin D assay. The necessity for constant and standard rachitic animals tended to discourage the study of other diets.

More recently, the experimental diets used in the production of rickets were systematically investigated over a wide range of possible variations by Brown and others,[25] Querido [26] and Shohl.[1] This was made possible by the addition of varying amounts of salts of calcium and phosphorus to a basal diet of corn and gluten. The lower limit approximated calcium and phosphorus starvation, and the upper limit, which was obtained by feeding a mixture which contained 20 per cent salt mixture, constituted all the calcium or the phosphorus that the animals would eat. It thus became obvious that not only the ratio of calcium to phosphorus but the absolute amount of each at that ratio determines the rachitogenic properties of the diet. As the ratio of calcium to phosphorus was increased for a given level of phosphorus, rickets became more intense (for low phosphorus diets). As the absolute amounts were diminished, the degree of rickets became more intense, not only for the high calcium–low phosphorus diets and the low calcium–high phosphorus diets but for the low calcium–low phosphorus diets. The last group of diets fell in the zone of calcium to phosphorus ratio of 2:1 to 1:2, which was previously considered to be "normal" or, at least, was not considered to be associated with rickets. In all cases in which the amounts of calcium and phosphorus were sufficient and the disproportion not too great, normal bones were produced and extra vitamin D was not needed.

Because both calcium and phosphorus are necessary to form bone, theoretically any substance which prevents the adequate utilization of either should lead to abnormalities in bones and possibly to rickets. Work on low in calcium diets in this regard is lacking. With diets low in phosphorus, not only does a high calcium level prevent adequate utilization of phosphorus but the other metals which form insoluble phosphates (except barium, which is too toxic even for experimental trial) cause rickets. In this list are beryllium,[27] magnesium,[28] strontium,[29] iron,[30] lead [31] and thallium.[32]

RICKETS AND THE ACID-BASE CONTENT OF THE DIET

The metabolism of vitamin D not only is interrelated with calcium and phosphorus but is dependent on the acidity of the diet. It has long been believed that acidity is associated with rickets and alkalinity with tetany. The acidity of the food can be considered both from the point of view of the true acidity, or hydrogen ion concentration, and from the stoichiometric point of view, in which consideration is given to the excess of mineral acids or bases. The true acidity exerts its effect principally on absorption from the intestinal tract. On the acid side the absorption of calcium and phosphorus is facilitated; on the alkaline side the absorption is retarded or inhibited. The potential acidity or alkalinity of a diet depends on the amount of alkaline elements, calcium, magnesium, sodium and potassium, as compared with the amount of acid elements, chlorine, sulfur and phosphorus. Acid foods, meaning those which have an excess of the acid elements, increase the excretion of calcium and phosphorus. Foods which are potentially alkaline tend toward diminished excretion and hence to a greater retention of calcium and phosphorus in the body. The total effect is therefore the result of the true and the potential acidity of the food.

An advance has recently been made by Hamilton and Schwartz,[33] who were able to separate and combine the effects of the diet on absorption and metabolism. By the use of a diet which provided an excess of organic acid and an alkaline ash, they facilitated both absorption and retention of calcium and phosphorus. Diets which were alkaline in reaction and which had an acid ash hindered both the absorption and the retention of calcium and phosphorus. These workers were able to convert rachitogenic diets into normal diets by the addition of organic acids and alkaline ash. They were able also to produce rickets by adding alkalis plus acid ash to normal diets. The former diets contained additions of tartaric acid and sodium tartrate, and the latter, additions of ammonium carbonate and ammonium chloride. Shohl [34] found that these effects were not due entirely to the acid-base properties of the diet but were due also to a specific organic acid effect, in which the tartrates were involved. The citrate ion showed even more pronounced effects. Additions of citric acid plus alkaline residue to rachitogenic diets were found to prevent or cure rickets. This result was obtained not with a single type of diet but with several widely different combinations of calcium and phosphorus.

UTILIZATION OF CALCIUM AND PHOSPHORUS

The diets which produce rickets exert a profound influence on the body economy. This is evidenced by

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30. Diamond, L. K., and Brock, J. F.: Rickets in Rats by Iron Feeding, J. Pediat. **4**: 442 (April) 1934.

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32. Rominger, E.; Meyer, Hugo, and Bomkov, C.: Rachitisstudien: die P-Stoffwechselstörung bei der experimentellen Thallium-Rachitis, Ztschr. f. d. ges. exper. Med. **78**: 272 (Aug.) 1931.

33. Hamilton, Bengt, and Schwartz, Charles: Rôle of Acidosis and Alkalosis in the Etiology of Rickets, Am. J. Dis. Child. **48**: 669 (Sept.) 1933. Hamilton, Bengt, and Dewar, M. M.: Effect of Citrate and Tartrate on Experimental Rickets, Am. J. Dis. Child. **54**: 548 (Sept.) 1937.

34. Shohl, A. T.: The Effect of the Acid-Base Content of the Diet upon the Production and Cure of Rickets with Special Reference to Citrates, J. Nutrition **14**: 69 (July) 1937.

their effect on the blood serum content of calcium and of inorganic phosphate. In general the composition of the blood serum in this respect reflects the composition of the intake. High calcium and low phosphorus rachitogenic diets are associated with a low inorganic phosphate content in the blood serum, a condition similar to that found in human rickets and hence utilized extensively for studies in experimental rickets, especially for vitamin D assays. Similarly, a low calcium and high phosphorus intake is associated with serum calcium values which are at or near the tetany level. In such cases the serum phosphorus is elevated roughly in proportion to the intake.

The absolute amounts as well as the ratio of the calcium to the phosphorus determine the content of these elements in the blood serum. At any ratio of calcium to phosphorus in the food, as the absolute amounts increase the serum calcium and phosphorus, respectively, increase also. When vitamin D is given, the blood serum values tend to become normal, regardless of the type of diet.[35]

The effect of the acid-base content of the diet on the composition of the blood serum seems to be secondary to the ratio and level of calcium and phosphorus of the diet. In selected cases, however, it can be shown that acid ash diets produce a blood picture which tends toward rickets and that alkaline diets tend to cause healing.

It has been a favorite thesis of Freudenberg and György [36] that rickets is associated with an acid metabolism and tetany with an alkaline one. György has relied on determinations of the ammonia in the urine, a reliance which has been seriously questioned by Morris, Ford and Graham.[37] György also has cited early work of Hodgson,[38] who reported that greater doses of sodium bicarbonate were required to make the urine alkaline for rachitic children than for normal children. However, the classic rickets-producing diets are alkaline, and tetany may be induced even with acid phosphates. In neither clinical nor experimental rickets, nor in rachitic tetany, is there a definite alteration of the acid-base equilibrium of the blood.

After material has been absorbed from the intestine, it must take one of three paths. It may be subsequently excreted by the kidneys, it may be reexcreted into the intestine or it may be deposited in the tissues. Thus the amount of material in the stool represents both unabsorbed material and that which has been reexcreted through the intestine. Further, the calcium and phosphorus which are excreted may come either from that ingested or from that which is stored in the body. Calcium is excreted almost wholly by the bowel, about 90 per cent in infants and about 60 per cent in adults, and the major portion of the phosphorus may be excreted either by the kidneys or by the intestine. An excess of calcium causes a reduction in the urinary phosphorus; [39] an excess of phosphorus results in low urinary calcium values.[40] Acid increases the urinary excretion of calcium and phosphorus,[41] and alkali increases the proportion found in the feces. Parathyroid hormone [42] also causes an increased excretion of calcium and phosphorus in the urine.

In clinical rickets there is an increased excretion of calcium in the feces, and the amount in the urine, normally small, is further decreased. The elimination of phosphorus in the feces is also markedly increased. As was first shown by Schabad,[43] it may exceed the fecal calcium. In infantile rickets both the calcium and the phosphorus balance are subnormal. They may be negative in severe rickets but usually are not.[44]

The effect of the administration of vitamin D is striking. Not only is the blood serum restored to its normal content of calcium and inorganic phosphate, but the metabolism is markedly altered. The amount of calcium and of phosphorus in the feces become reduced, while the amounts in the urine increase. The retention is also increased, so that one sometimes refers to the phenomenon as an increased "net absorption" of calcium and phosphorus.[6]

In experimental rickets the retention values reflect the amounts of calcium and phosphorus in the diet. When vitamin D is given, the blood serum values approach the normal. The absorption is affected similarly to that of infants, but the absolute retentions or the ratio of the calcium retained to the phosphorus may not be restored to normal. High calcium and low phosphorus diets result in high calcium and low phosphorus retentions, vitamin or no vitamin.[17]

Vitamin D and Parathyroid.—The relationship of vitamin D and parathyroid hormone has been intensively investigated.[45] It was suspected that their actions were interdependent, but it now seems clear that, although both raise the level of calcium and of phosphorus, the action of each is quite different. Parathyroid acts more specifically on the serum calcium. When it is given for parathyroprivic tetany the serum calcium level is dramatically raised and the phosphate content may be depressed. Only when toxic doses are given is the effect in raising the phosphate level marked. Vitamin D has its most spectacular action in raising a low serum phosphate level in rickets. As previously stated, in toxic doses it increases the calcium content above normal and may depress the phosphate content if it is high. Parathyroid seems to act principally by withdrawal of calcium from the body; vitamin D, by increased absorption, or diminished reexcretion into the bowel. The toxic effect of parathyroid is decalcification; that of vitamin D, hypercalcification.

In rickets, as originally shown by Erdheim and repeatedly confirmed, the parathyroid glands enlarge

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and the cells hypertrophy. This occurs in human beings, rats, rabbits and fowl. Hamilton and Schwartz [46] were able to demonstrate an increased hormone content in the serum of rachitic rabbits. This overactivity of the parathyroid glands is not the cause of rickets but is caused by rickets. The reaction is apparently a defense mechanism of the body to preserve the normal level of serum calcium, so essential to the body economy. As far as rickets is concerned, this hyperfunction of the parathyroids intensifies rather than ameliorates the condition. Shelling, Asher and Jackson,[47] Collip and his co-workers [48] and Waltner [48] found that injection of the hormone exaggerated the rachitic process in rats. Hoag and his associates [49] and Fine and Brown [50] found that it retarded the healing. Such action depends on the type of diet. With a normal diet, not rickets but osteitis fibrosa cystica results. Further, Pappenheimer [51] and Shelling [52] both stated that it is more difficult to produce rickets after removal of the parathyroids.

OTHER PHASES OF VITAMIN D METABOLISM

The metabolism of calcium and phosphorus has been discussed in relation to vitamin D. Certainly the metabolism of magnesium and of iron also must be affected. The relation to carbohydrate metabolism has been hinted at in relation to phosphatase. The fat metabolism also is interrelated to the problem. If fat is not utilized, the fatty acids are excreted in the intestine, where they form calcium soaps and thus interfere with the calcium and phosphorus economy.[53] In such conditions as fatty diarrhea and celiac disease, rickets may intervene. Rickets thus caused is amenable to vitamin D therapy.

A great deal has been written on the relation of dental caries to vitamin D, especially by May Mellanby [54] and the English workers. Insofar as the teeth are part of the bony structure, the relation to vitamin D seems straightforward. However, the explanation of the underlying physiologic and pathologic process is still clouded, and the multiplicity of therapies indicates that vitamin D is not the sole factor.

For the pregnant or lactating woman faulty diet and paucity of vitamin D present a real problem. There is no doubt that the offspring may come into the world with poorer reserves of antirachitic factors. The mother and infant show symptoms of calcium and phosphorus deficiency.[55] Congenital tetany and early rickets are found when searched for. The fact that vitamin D is excreted in the milk [56] suggests the possibility of prophylaxis against rickets in the infant through ingestion of vitamin D by the mother.

Renal rickets is associated with damaged kidney and upset of the phosphate excretion, often complicated by acidosis.[57]

Finally, intractable rickets has been reported, for which the therapeutic effect of vitamin D could be obtained only when the dose was multiplied many thousand times. These are but a few of the problems the solution of which lies in the future.

SUMMARY

To summarize known facts, it may be stated that the study of the physiology and pathology of vitamin D has advanced to the point where it is recognized that:

The metabolism of vitamin D is closely related to the composition of the diet, especially the content of calcium and of phosphorus and the acid-base value.

The metabolism of vitamin D is related to the parathyroid hormone, phosphatase and other factors.

The main action of vitamin D is to increase the absorption of calcium and phosphorus or to diminish their intestinal excretion.

When the concentration of Ca^{++} and $(PO_4)^{---}$ in the body fluid surrounding the degenerating cartilage cell as measured by the state in the blood is sufficiently great, deposition of salts in growing bone occurs.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

AUDI-EAR NOT ACCEPTABLE

Manufacturer: American Earphone Company, 10 East Forty-Third Street, New York.

The Audi-Ear is a transparent reflector placed next to the ear. The instrument is recommended for the moderately hard of hearing. It operates without a battery. The unit is approximately 1¼ inches long and one-half inch thick. A molded earpiece may be used with the device to hold it firm against the ear, in which case a head band is not necessary. It may be carried in one's pocket when not in use, as it comes in a carrying case which protects it against breaking. A single Audi-Ear may be used in either the right or the left ear. Two of these devices may be used only when the hearing impairment in the two ears is similar. The firm states that the unit may be used on trial for ten days and if unsatisfactory the cost price will be refunded except for a slight fee for trial.

The unit was investigated under conditions acceptable to the Council. Two patients were tested. One had an approximately uniform hearing loss of 30 decibels from 64 to 8,192 cycles, and the other had a uniform loss of approximately 45 decibels over the same frequency range. The former had normal bone conduction, while the bone conduction of the latter was slightly below normal. Only the hard-of-hearing person with the 30 decibel loss obtained any value from the use of this device. The improvement was noted as a slightly more natural quality of speech rather than an increase in loudness or intelligibility. Apparently it is of value to only a very small percentage of hard-of-hearing persons, those with slight losses who have more loss for the high frequencies than the low. It is roughly equivalent to cupping the hand behind the ear.

In the light of available evidence, the Audi-Ear Hearing Aid is of value to relatively few hard-of-hearing persons. The advertising matter contains misleading statements, such as "Does for your hearing what eye-glasses do for your sight." Hard-of-hearing persons may purchase the unit believing that it will be of real benefit. Influenced by the exaggerated claims made in the advertising matter, the public may be mislead as to its actual value. The Council on Physical Therapy voted not to accept the instrument in the interest of the welfare of the public.

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SATURDAY, AUGUST 13, 1938

THE COLUMNISTS COMMENT ON THE ARNOLD PRONUNCIAMENTO

Elsewhere in this issue (p. 623) appear editorials published in various newspapers relative to the pronunciamento of Thurman Arnold, who proposes to determine whether or not the American Medical Association is a monopoly. Seldom has an action taken by the Department of Justice aroused the public interest and attention developed by this action. In addition to the editorials which have appeared in the newspapers, practically every one of the columnists syndicated in newspapers throughout the country has had something to say on the subject.

Paul Mallon, widely circulated by King Features Syndicate, in his column News Behind the News, after describing the case and stating that if the American Medical Association is a monopoly so is the American Bar Association, says that this suit—

> would simply mean the Justice Department is misnamed and has become instead a prosecution department to enforce, not alone the law, but social and economic theories.

Mr. Mallon also indicated that application of this principle would mean that newspaper correspondents might object because some of them cannot get into the press galleries of Congress, and the attendance on the President's press conferences is also strictly limited. Those who can get in have a great commercial advantage over those who cannot.

Mr. Hugh Johnson feels that the attitude of the American Medical Association in resisting cooperatives is "heading straight for the dog-house of public disfavor" but he is inclined to think that the Department of Justice has not picked out the way—

> to bring about the desired end. . . . It is a slick, novel and sort of smart-aleck use of a 40-year-old law for a purpose which nobody ever before believed that it was intended.

David Lawrence, widely syndicated, feels that—

> the doctors have a society which is as much entitled to protection under the Wagner Relations Act as any other association of service workers.

After explaining his view that the Department of Justice has intervened principally to help the Group Health Association, Inc., Mr. Lawrence says,

> The attempt to drag the antitrust laws into a controversy over what is or is not proper medical care is a piece of amazing political stupidity, but it is another example of how the zealots in the administration, with the full approval of President Roosevelt, are manipulating the laws of the United States to gain the goals of their so-called social experiments.

Mrs. Walter Ferguson, after explaining the nature of the controversy in Washington, says:

> The average layman holds himself aloof from the controversy about his welfare now raging between the federal government and the American Medical Association.
>
> If he is a middle-class citizen, he considers himself a martyr and is fond of saying that only the very rich and the very poor receive any consideration from doctors—although I doubt whether he would be willing to exchange places with the poor.
>
> If we are honest, we must admit that our attitude toward the doctor has always been irritable and without consistency. We're ready to spend money on everything except our health. Most families will make any sacrifice to buy an automobile on the instalment plan, while they feel much aggrieved if they have to invest monthly sums to pay for medical attention which may have kept one of them out of the grave.

In the Baltimore *Sun* Mr. Henry L. Mencken says:

> A defect common to all the plans so far proposed is that they are confined to employed persons and offer no aid to the unemployed. The latter are thus thrown on the free clinics, which are mainly manned by doctors who get nothing for their work.
>
> This puts a very heavy burden on the medical profession, and there are doctors who begin to find it almost intolerable. Proposals have been made that the federal government offer them some remuneration, and no doubt this will be done as soon as the New Deal wizards can get around to it.
>
> But whether the doctors will accept remains to be seen. Most of them are unalterably opposed to going on the public pay roll and so submitting their work and their fortunes to the will and whim of politicians.
>
> Their opposition is hardly likely to be lessened by the fact that all the Communist organs have begun a violent campaign against them, denouncing them as sharks and scoundrels. Or by the fact that the New Deal has now joined in.

A newspaper columnist named Jay Franklin, who has repeatedly attacked the American Medical Association since he first appeared on the newspaper horizon and who endeavors to identify the Editor of THE JOURNAL as personally responsible for every policy of the American Medical Association, devotes most of his discussion to a further attack. It is impossible to find anything in his column sufficiently sensible to merit quotation. He writes as though authoritatively without having made the slightest apparent effort to find out the facts. In contrast, Bugs Baer, in a few succinct sentences, puts his finger squarely on the political motives involved in the attempt to make medical care the issue in future political campaigns:

> The doctors don't approve of the federal health plan subject to a prescription by thirty-six states. A Democratic pharmacist deciphering a Republican doctor's diagnosis might mix in too much filibuster and not enough relief.
>
> Health shouldn't be subject to politics. And when we're sick we don't want the opposition voting on it.
>
> The insurance companies are nonpartisan. They pay off like a slot machine either way.

RESISTANCE TO TUBERCULOSIS

Resistance to tuberculosis decreases with age and older animals are relatively susceptible to this infection is the surprising conclusion of Smithburn[1] of the Rockefeller Institute, from his study of experimental tuberculosis in guinea pigs.

Statistical and experimental evidence led earlier immunologists to the generalization that resistance to all infectious diseases increases with age, reaching its maximum in early adult life. After the thirty-fifth year a gradual decrease in antimicrobic defense was postulated.

Some doubt as to the universality of this law may arise from study of the relative susceptibilities of young and adult rabbits to streptococcus and staphylococcus filtrates. Up to the age of 4 months newborn rabbits can be injected intravenously with presumably multilethal doses of staphylococcus toxin without appreciable toxic symptoms.[2] Adult rabbits are killed within twenty-four hours by a fraction of the same dose per unit of body weight. This youthful tolerance to staphylotoxin is not serologically transferable and is conceivably due to the greater "growth vigor" of juvenile tissue cells. Other theories, of course, have been proposed. That there is a similar juvenile tolerance to staphylotoxin and streptotoxin in man is shown by the failure of children to react to endermic tests with these toxins,[3] most adult skins being highly reactive.

In order to test the relative susceptibility of different age groups to tuberculosis, Smithburn inoculated groups of normal guinea pigs of different sizes with arbitrary doses of highly virulent and moderately virulent human and bovine strains of Mycobacterium tuberculosis. The inoculations were made intracerebrally. Each animal was allowed to succumb to the infection, and the mean survival time per group was thus determined. In one series, for example, a group of five elderly guinea pigs (900 Gm., three females, two males), five middle-aged animals (450 Gm.) and five young guinea pigs (150 Gm.) were each inoculated intracerebrally with 0.00001 mg. of a highly virulent human strain of the tubercle bacillus. The mean survival time for the elderly group was 23.8 days, for the middle aged group 27.6 days, and for the juvenile group 35.8 days.

When subjected to statistical analysis, these differences are significant, particularly when reduced to the basis of dose per unit of body weight. Thus the young animals received on an average 7.7 times the calculated dose per kilogram of body weight given to the oldest group and 3.3 times the middle aged dose. Smithburn concluded from his evidence that resistance to tuberculosis "as measured by survival time of guinea pigs after intracerebral inoculation" decreases with age, young animals being approximately ten times more tolerant than elderly controls. Whether or not this juvenile tolerance to tuberculosis occurs in human epidemiology was not discussed.

1. Smithburn, K. C.: Proc. Soc. Exper. Biol. & Med. **38**: 575 (May) 1938.
2. Parrish, H. J., and Okell, C. C.: J. Path. & Bact. **33**: 527 (July) 1930. Trask, J. D.: J. Immunol. **22**: 41 (Jan.) 1932. Burky, E. L.: J. Allergy **3**: 438 (July) 1932.
3. Cooke, Jean: Proc. Soc. Exper. Biol. & Med. **24**: 314 (Jan.) 1927.

THE DETERMINATION OF CALCIUM REQUIREMENTS

Henry C. Sherman[1] of Columbia University holds that the American diet is frequently deficient in calcium and that a calcium deficiency may be avoided by regulating the diet to include more foods with ample calcium content. Although the Sherman standards for optimum daily calcium intake are widely accepted, investigators are not agreed as to minimum calcium requirements. One difficulty in determining the basic requirements for such elements as calcium, iron and phosphorus is that they are not accurately indicated by the rate of retention in the body at any given time.

Fairbanks and Mitchell,[2] who studied factors affecting calcium retention in rats, point out that the highly variable retention of calcium reported in children may be due to the variable condition of their skeletal tissues with respect to calcium storage. This has been emphasized previously, but it appears to be a point that has been overlooked in many discussions of the calcium needs of the body. Boldt, Brahm and Andresen,[3] for example, showed that previous depletion of the calcium stores will accelerate its storage.

Fairbanks and Mitchell undertook a study of the rate of retention of calcium during periods of experimental feeding of rats on different calcium intakes. They found that the extent to which the skeleton is saturated with calcium determines the rate of calcium retention, low saturation being associated with subsequent high retention of calcium. Calcium retentions observed under conditions of adequate nutrition are an index of calcium requirements only when the calcium stores have been saturated by appropriate prefeeding. In evaluating experiments in which this precaution has not been taken, more significance can be attached to the lower rates of calcium retention than to the higher as measures of actual requirements. This is in accord with conservatively accepted information concerning the nutritional needs of calcium; namely, that medication with calcium is not indicated unless there is a prolonged dietary deficiency.

The University of Illinois investigators conclude that the actual calcium content of growing rats is dependent

1. Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934.
2. Fairbanks, B. W., and Mitchell, H. H.: The Relation Between Calcium Retention and the Store of Calcium in the Body, with Particular Reference to the Determination of Calcium Requirements, J. Nutrition **11**: 551 (June) 1936.
3. Boldt, Franziska; Brahm, Carl, and Andresen, Gertrud: Langfristige Mineralstoffuntersuchungen an zweigesunden, Säuglingen bei mineralstoffarmer und -reicher Kost, Arch. f. Kinderh. **87**: 277 (No. 4) 1929.

on the calcium content of the diet, if it contains a percentage of calcium inadequate for maximum storage, and on the rate of growth, which is dependent in turn largely on the rate of food consumption. The first relation is a direct one, the latter an inverse one, rapid gains being associated with low calcium content. Furthermore, the commonly accepted belief that females contain higher percentages of calcium in their bodies and in their bones than males of the same age seems to be entirely referable to the slower growth. Finally, since the calcium content of growing rats and the extent of calcification of their bones are dependent on the amount of food consumed as well as on its mineral content, control over the total food intake is essential for accurate interpretation of experimental results.

Current Comment

THE RED TAPE BEGINS TO UNWIND!

If any one is in doubt as to what happens under state medicine, the following example should be convincing: In the case of a woman in the state of New York who was ill, attention was given by a local physician, who then notified the relief official that prolonged medical care would be required. The case supervisor for the public welfare official then sent the following letter:

We are enclosing forms which are to be forwarded to the state department where prolonged medical care is needed.

We are asked to send a letter from the doctor with these forms giving a complete medical history of the patient which will include the date of onset of illness, the diagnostic procedure used and any laboratory findings. *The name, strength and quantity of the material used for injections will be reviewed by a state physician.*

The red tape begins to unwind and before the spool runs out all of medical practice may be wrapped in its meshes.

OXFORD HONORS HARVEY CUSHING

The University of Oxford in July conferred on Dr. Harvey Cushing of New Haven the honorary degree of doctor of science. The event was more than academic, for Dr. Cushing, the *Lancet*[1] says, also received expressions of affection and respect that few other men could command. The famous surgeon was described as a man who had removed more than 2,000 brain tumors, as a great baseball player who had taken up surgery, as an innovator in technic who performed not only with scalpel but with the pen, as the biographer of his friend William Osler, and as a benefactor of the wounded in France in the World War. At a luncheon given by the vice chancellor before the ceremony the guests included Sir Almroth Wright, Sir Richard Livingstone, Dr. E. H. Cushing, a nephew, Drs. Clovis Vincent and Thierry de Martel of Paris, Dr. Arnold Klebs, Professor Bastianelli of Rome, three former surgeons in chief of the Peter Bent Brigham Hospital in Boston, where Dr. Cushing did much of his surgical work, and former pupils who now hold positions in Brussels, Louvain, Amsterdam, Manchester, Edinburgh, Leeds, London, Oxford and Newcastle-on-Tyne. A distinguished group attended a party also at the Nuffield Institute. On Sunday morning Dr. Cushing gave a clinic demonstrating a case of pituitary basophilism. It was an international occasion. In presenting him for the honorary degree, the orator said:

Ecce chirurgus primarius, qui fausto exitu plus bis millies, ut verbis Ennianis utar, tumescens ferro "cere-comminuit brum." Medicis patre, avo, proavo prognatus et in Vniversitate Yalensi cum Doctoris gradum tum pilae lusoris litteram adeptus, postquam in Europa quoque disciplinam suam secutus est, domum reversus difficillimam cerebri secundi artem—id quod ipse olim chirurgiae Symplegadas nominavit—aegrotantibus maxime optiulair verbis arguebat, factis probavit. Quin ipse in hac arte mirum quantum provectus qui tardius agat melius agere demonstravit. Multum huiusmodi remediis prodesse vim electricam credebat; naturae fortasse medendi facultati diffidebat, nihil certe fortunae permittebat. Idem per viginti annos in Vniversitatibus Yalensi et harvardiana Professor quod ipse didicerat, discipulos docuit, quorum complures hodie famam sibi maximam vindicaverunt. Nec scalpello tantum hic usus est sed etiam stilo. Nonne de nervis, de cerebri textura, de glandula pituitaria τίχην ἔχουσι permulta scripsit? nonne nobis ἱδιώται amici sui Willelmi Osler monumentum exegit praeclarissimum? Nunc, cum rude donatus ad nos hospes advenerit, ut viro honoribus prius cumulato nos quoque tributum nostrum offeramus, praesento vobis chirurgum eminentissimum, Harvey Cushing, illustrissimi ordinis de Balneo comitem, ut admittatur honoris causa ad gradum Doctoris in scientia.

MAJOR AND MINOR SURGERY

In two recent communications, Hubert A. Royster makes a plea that the term "minor surgery" be eliminated from our nomenclature because of possible implications. He advances the argument that the labeling of certain procedures as minor may mislead an intern or a general practitioner into believing that any condition requiring surgical intervention can be regarded as minor. Only one of 104 surgeons whom he consulted believed the division of surgery into major or minor is justified. The principal objection to the term, it appears, is that it is vague and ill defined. There exist no definite criteria by which to designate any one procedure as minor or major. What appears to be a simple procedure may develop into the most complicated one. What is a minor operation in the hands of a skilful surgeon may prove a major one in the hands of the unskilled surgeon. Such criteria as time required to perform an operation, the mortality, the skill required, the question of anesthesia, the question of whether it can be performed in the office or requires hospitalization are all variables. The suggested substitutes for the term minor surgery, such as office surgery, ambulant surgery or dispensary surgery, are hardly an improvement. Royster argues that all surgery is based on the same fundamental principles and is therefore not divisible. In no other field of medicine does a similar division into major and minor procedures exist. Actually the term minor surgery has largely disappeared from the curriculums of our leading medical schools.

1. Dr. Cushing at Oxford, Lancet 2:226 (July 23) 1938.

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ORGANIZATION SECTION

EDITORIAL COMMENT ON THE ARNOLD PRONUNCIAMENTO

THE SOFT IMPEACHMENT

New York Herald Tribune, August 2

The nation is just getting itself adjusted to Mr. Thurman Arnold's novel method of antitrust prosecution by what might be called the soft impeachment. His recent announcement that he was setting out to enjoin the motion picture companies as violators of the law, but was doing so in only the most constructive and friendliest possible spirit, had much to recommend it; here at last, it seemed, was a way through which the antitrust laws might be made into really serviceable instruments of rational industrial regulation. But when Mr. Arnold suddenly extends the same polite constructivity into the nonindustrial problem of group medicine one is not, in the first moment of astonishment, quite so sure.

The implications of the proceeding are so remarkable as rather to overshadow the specific allegations of sabotage against the district medical society. To begin with, Mr. Arnold can scarcely have much confidence that a criminal prosecution would stick in the courts. There are various decisions to the effect that the prohibited restraint of "trade or commerce" must apply to goods or commodities, while the Clayton act specifically excludes the "labor of a human being" as an article of commerce. Surely, a doctor's laborious services could not easily be brought within the scope of the antitrust laws. But the Arnold method is not aimed at a court battle; it proposes rather to extort a consent decree without one.

The consent decree has been used before now to enforce, through the mere threat of prosecution, an extent of governmental regulation which the prosecution itself might fail to sustain. That aspect of Mr. Arnold's sweet reasonableness might not matter so much in the proper field of antitrust law, where there are always plenty of capable opposing counsel; but extended into the problems of medical practice it seems fraught with ominous possibilities.

And there are other peculiar things about this proposal to settle the complex social issues centering around medical care by the kindly intervention of the Department of Justice, with criminal charges and a grand jury investigation. Mr. Arnold himself notes, under the head of "economic results to be expected" that prosecution in the nation's capital will ensure "adequate publicity." (It could ensure little else; for, since medicine, if "commerce" at all, is certainly not interstate commerce, the federal law would operate only in the District of Columbia.) At a moment when the New Deal seems pretty hard put to it for popular issues next year and is clearly working up the health insurance question as a possible means of filling the gap, this device for showering "adequate publicity" upon the matter has an unpleasantly political connotation.

The Department of Justice, for all its excellences, is clearly not the appropriate agency for regulating American medicine. And if its new policy under Mr. Arnold is going to be bent to the uses of political stratagem, it will cease to be an appropriate agency for regulating anything else.

NEW DEAL BUFFOONERY

Troy, N. Y., Times Record, August 2

There is something excruciatingly funny about the antics of New Dealers when somebody challenges their benevolent tyranny. In their own estimation, from the President down, they seem to believe honestly that they are the anointed of the Eternal, infallible in every detail, and therefore entitled to ignore law, courts, custom and all other conventions that civilization erects for its own protection. If the courts are in the way, pack them. If laws oppose a plan, scrap them. If Congress refuses to act on such laws, twist them. If men question New Deal objectives, denounce them.

So the men who are directing the plastic intelligence of the President along radical lines toward collectivism have decided that cooperative medicine, at first voluntary and at last compulsory, must be introduced into the United States while the going is good. The American Medical Association does not approve it. In this attitude it has most of the nation behind it. So the A. M. A. decides to bar from its membership those who favor cooperative medicine—which it certainly has a right to do. Its position is precisely the same as any club which bars this or that group from its privileges; for a club is a voluntary association.

But the New Deal bunch are angry. So the word has gone out that the A. M. A. must be attacked by law. An injunction will be sought compelling it to admit to its membership the New Deal gang of doctors. In short, New Dealism proposes to force its way even into voluntary associations. The next step will be to insist that all newspapers publish all its lying hand-outs and be enjoined wherever they refuse.

There is no law for such compulsory breaking down of social preferences. Censorship cannot go thus far. The New Deal proposal is silly and tyrannous. It has in it not a single ingredient of honest Americanism. It is purely Russian—as are many of the New Dealers. The courts are not yet packed by the Roosevelt régime and there is not a chance that any such processes will win. But that such efforts should be made ought to be evidence enough of the program of repression and dictation which Washington intends to carry out if it can get the power into its hands.

NEW DEAL MEDICAL BLUFF

Indianapolis Star, August 2

The Justice Department apparently is acting under New Deal orders to use threats and coercion on the organized medical profession in an effort to further the schemes of so-called state medicine. The department has accused the medical association of alleged illegal activities against cooperative groups formed to lower the cost of medical care. One of its assistants said a preliminary investigation indicated possible violation of antitrust laws.

An honest difference of opinion exists among members of the medical profession, but nothing to date has justified the attempted interference of government agents, particularly on antitrust claims. Organized medical societies should be able to exercise majority rule in determination of policies deemed necessary for public and professional welfare. Some physicians affliated with the cooperatives are said to have been excluded from Washington Hospitals. That reported condition in the District of Columbia does not justify blanket charges applying to all the profession.

The government's charges evidently were designed to intimidate the medical profession into acceptance of the socialistic spending contemplated by the New Deal health program. The President's advisory committee recently recommended expenditure of hundreds of millions on a national health program, which would extend governmental paternalism, impose an additional burden on the taxpayers and add to the list of residents who assume with some reason that the government will supply every need for the rest of their lives. State medicine makes almost inevitable a bogging down of professional standards which have contributed to the high plane of scientific progress.

It is true that many cannot pay for medical care. State and local clinics provide aid, much charity work is performed throughout the country and both medical and dental groups are sponsoring time-payment plans. Persons needing professional

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attention usually get it, regardless of financial circumstances. The socialistic schemes fostered at Washington, however, are training too many to believe they can become permanent wards of the taxpayers.

A CHARGE OF MONOPOLY

Philadelphia Public Ledger, August 2

Lately there have been several indications that certain federal authorities regard the representatives of organized medicine as enemies. Though admitting the "absence of moral turpitude," the Department of Justice is bringing criminal proceedings against the American Medical Association and the District of Columbia Medical Society, intending to prove that these organizations have violated the antitrust laws by interfering with the workings of a health association of government employees.

The medical groups, it is charged, have threatened expulsion and other disciplines for physicians supplying their services to the Group Health Associated, Ltd. It is implied that by doing so they are endeavoring to maintain a monopoly in medicine.

But the long-established rules and policies of organized medicine are mainly designed to defend its standards and codes of ethics. The medical profession is self-governing. And this, perhaps, is what the New Deal Administration doesn't like about the medical men. They are rebels against the policy of benevolent regimentation. They believe they can mind their own business better than Washington. By invoking the antitrust laws the government has gone a long way for a weapon against them.

IS THERE A MEDICAL TRUST?

Philadelphia Record, August 2

The government is starting antitrust action against the American Medical Association, just as if it were a widget manufacturing corporation.

Treating the A. M. A. as if it were just another business will probably offend some of the nation's eminent and distinguished doctors.

But they have brought it on themselves.

Medicine is not a business. It is a science and an art, a great calling set apart from the humdrum round of ordinary activities. But the conservative A. M. A. leadership has been doing its best to act like the board of directors of a watch-fob trust intent on controlling the market.

They have fought "competition" as bitterly as any tight little trade organization. Not the competition of quacks and charlatans (in fighting them the A. M. A. has done brilliant and useful work), but the competition of regularly licensed physicians who have endeavored to work out practical methods of group medical care.

The Department of Justice is proceeding in the case of the Group Health Association of Washington. This is an organization formed by 2,500 government employees who sought to protect themselves against the disastrous expense of major illnesses by combining, hiring doctors, setting up a clinic and meeting expenses by small monthly premiums.

Insurance, no more, no less.

The answer of organized medicine has been the bitterest hostility. Hostility based not on any quarrel with the methods of treatment or the qualifications of the doctors, but on the methods of payment alone—hostility based on the fear of competition.

Doctors working for the group have been threatened with expulsion from the local medical societies affiliated with the A. M. A. One doctor has been expelled. The facilities of hospitals (even in emergency cases) have been denied to doctors connected with the group plan. Every effort has been made to hurl these doctors into the outer darkness.

The Department of Justice, through Assistant United States Attorney Thurman Arnold, has started an investigation. It offers to drop it if the A. M. A. and the local medical society accept a consent decree. Arnold carefully points out that he is not defending group practice but merely trying to "prevent artificial impediments by organized groups" against any legal efforts to lower the appalling costs of medical care—costs completely beyond the reach of the average worker.

We think this investigation is vital. We think the A. M. A., instead of doing a scientific job of studying group medical practice on its own, has blindly chosen to isolate itself from the major currents of contemporary medical thought. It has disheartened many physicians, as witness the growing rebellions against the A. M. A. leadership in the A. M. A.'s own ranks.

Despite the A. M. A.'s opposition, the drive for health insurance and group practice continues. The Committee of 430, the rebel group in the A. M. A., includes some of the most famous names in medicine. Entire state organizations, such as the California Medical Association, have revolted and plumped for health insurance. On the West Coast the famous Ross-Loos Clinic, offering complete medical care for $2 per month per family, now has 50,000 members, fifty-five doctors, a five story building, an ambulance fleet.

We hope the A. M. A. comes to its senses. It should be the leader in improving the economics of medicine as it has been the leader in furthering the science of medicine. It has a splendid opportunity. If it is wise, it can retain a position of control as the years bring their inevitable changes.

If it is short sighted, it, and medicine and the public, will be the losers in the end. We don't suggest that the A. M. A. indorse group practice. We urge only that it permit, without hindrance, those experiments which alone can settle the question.

APPLICATION OF THE ANTITRUST LAW TO REGULATION OF MEDICAL PRACTICE

Arizona Republic, August 2

What is this sacred thing, the Group Health Association, that it may not be flouted with impunity? Is it not a long step in the direction of complete regimentation which now seems to have been the aim of the brain trust at the beginning six years ago and, perhaps, would now be well under way but for the intervention of the Supreme Court against NRA? But in many and devious ways that objective is still being approached.

If a membership list of the Group Health Association were obtainable, we think we would find it was largely made up of adherents of the New Deal.

Steps in the name of the Group Health Association have already been put under way against the American Medical Association and the District of Columbia Medical Society as violators of the federal antitrust law. Perhaps if it could be shown that these organizations had encouraged their members to agree upon the fees to be charged by the profession, and that as a result of such encouragement uniform and exorbitant fees prevailed, an action for violation of the Sherman antitrust act might lie.

But as we understand that is not the gravamen. Then what have the intended defendants done to call down upon them the wrath of the New Deal? They have been guilty of the sacrilegious act of speaking disrespectfully of the Group Health Association. They have signified that they want nothing of this association. They counsel the dissociation of their members from the group health physicians in the matter of consultation and hospitalization and other relations which are more or less private and personal. In short, they regard the health group idea as a form of heresy which should not be encouraged. That is, the head and front of the offending of the American Medical Association, a revolt against the New Deal.

The proposed action against the American Medical Association and the District of Columbia Society is quite similar to the proceedings of the National Labor Relations Board, whose interpretations of the Wagner Act are held to be sacred and not subject to questioning. It has thus become a crime to think evil of the rulings of the board.

It is the professed aim of the health group to provide medical and surgical aid for all who are in need of it. We have been making a gradual approach to that aim for many years, but the health group wants it done now, instanter. It is in that respect similar to nearly all New Deal projects, lacking in practicality.

We may suspect that the health group is more solicitous for the well-being of a class of physicians who for one reason or

another have fallen short of professional success, than they are that none should be deprived of medical care. For this they would regiment the practice of medicine and establish it on a lower level than that to which it has been brought mainly through the efforts of the men who are now more vigorously opposing regimentation.

If it should happen as a result the action threatened by the department of justice that the practice of medicine should be shorn of its independence and freedom and all practitioners should be reduced as nearly as possible to a common level, it would be a sad day for the country. In their wildest dreams the most insane of radical socialists nearly fifty years ago when the Sherman law was enacted could not have supposed that it could ever be applied to such a scheme for regimentation.

They might, and no doubt did, have in mind complete socialization, but they could not have imagined that it would ever be reached through an antitrust law. Certainly congress never contemplated such a use of the Sherman act.

A NEW USE FOR ANTITRUST LAWS

Philadelphia Inquirer, August 2

Public interest in the antitrust suit which the Department of Justice is now bringing against the District of Columbia Medical Society and the American Medical Association will not be confined to Washington. The widespread adoption of plans for group hospitalization and medical care will focus national attention on this unprecedented action.

Thurman W. Arnold, Assistant Attorney General, charges the organizations of physicians with violating the antitrust laws in attempting to prevent the functioning of a local group health association composed of government employees. Specifically the medical societies are accused of threatening expulsion of their own members who accept employment from the health group and also their removal from staffs of affiliated hospitals.

This alleged procedure is termed by Mr. Arnold an illegal boycott of health group doctors. He charges that the associations are endeavoring to set up a virtual monopoly of the community's medical services.

In proceeding against professional nonprofit organizations, which are not concerned with prices or commodities and in the ordinary sense are incapable of operating in restraint of trade, the Department of Justice has entered a field commonly regarded as outside the scope of antitrust laws.

The Washington plan that has encountered opposition from medical societies differs from the group hospitalization plan recently adopted for Philadelphia with the cordial cooperation of organized medicine. In Washington a group has retained its own staff of physicians and operates its own clinic. Under the Philadelphia plan subscribers take out insurance against the cost of hospital accommodations and treatment.

Whatever the outcome in Washington, Philadelphia has reason to congratulate itself on the agreement recently concluded between the Associated Hospital Service and the County Medical Society that will mean so much to the health of this community.

A MEDICAL CONTROVERSY

Boston Post, August 2

The action of the Department of Justice in charging the American Medical Association with monopolistic practices in connection with the Washington Group Health Association is, indeed, a radical departure from accustomed procedure.

The Group Health Association is a mutual organization of government employees. It provides all medical care necessary for its members by payment of a small membership fee.

Doctors are hired by the year. They earn their complete living in this way. As far as can be ascertained, the plan is working very well for doctors and patients.

Now it is alleged that the A. M. A. and its affiliate, the District of Columbia Medical Society, is attempting to prevent the success of the association by using the following methods:

The first is threatening expulsion of doctors from the A. M. A. for working for the association. The second is threatening expulsion from the society of doctors who consult with the association. The third is threatening expulsion from Washington Hospitals of the association staff doctors.

It can be seen that the methods charged are underhanded, and, if proven, monopolistic indeed.

There is no question that there is a large element in the medical profession which opposes departure from the time-honored individualistic conception of medical practice. And also there is no question that, in this day of government interference in every walk of life, a socially minded government wants to put over a sweeping plan of nationalistic medicine, as it has put over farm plans, soil plans, flood plans, unemployment plans and electric power plans.

But before we make up our minds that the present action has dragged a raw situation into the light, in which the American Medical Association is attempting to hold up the public for high fees, it is well to scan the record.

The association for a number of years has protected the public against the quacks which sprout like fungi in the broad field of medicine.

There is no subject that the general public knows less about than bodily health.

Illegal practitioners have been winnowed down to a minimum; medical schools of the racket variety have been put out of business; standards of state medical examinations have been raised and fake cures and hospitals have been exposed.

The general standard of medicine is higher in this country than anywhere else on earth. And it has been the voluntary membership of the American Medical Association, a free and unsupervised society, which has done it.

Of course, there has been much complaint against the mandatory methods of the Association, exercised against individuals and in legislative halls. But the ultimate result of it all has been beneficial.

Consequently, the government's present move should not be prejudged until the facts are known.

CLUB FOR MEDICAL 'TRADE'

Philadelphia Evening Bulletin, August 2

Anticipation that there would be something novel and spectacular in antitrust enforcement under Assistant Attorney General Thurman Arnold has been borne out. The proceedings just initiated against the American Medical Association and the District of Columbia Medical Society, intended to lead up to a Grand Jury investigation of the opposition to group medicine from the antitrust point of view, is a coup almost deserving the overworked adjective sensational.

The allegations charge an illegal boycott carried out through threats of exclusion from the District Medical Society, and the actual exclusion from Washington hospitals of physicians on the staff of the Group Health Association, Inc., an organization of government employees to provide themselves with prepaid medical care.

The Sherman Act and other antitrust legislation were expressly stated to be intended to prevent combinations in restraint of trade and commerce among the several states or with foreign nations. The "trust" aimed at was nothing vague or indefinite in the minds of those who pushed this legislation. The popular idea was well embodied in a noted cartoonist's conception of a pursy, bloated plutocrat in dollar-mark checked attire. There was accordingly considerable indignation when in the famous Danbury hatters case the Sherman Act was applied to a labor boycott. The Clayton Act of 1914 made the declaration that "the labor of a human being is not a commodity or article of commerce," and exempted from the operation of the antitrust statutes nonprofit labor and agricultural organizations not having capital stock.

Logically, professional skill and attainments would seem to be equally out of the class of commodities with which the antitrust statutes concern themselves. Of course, as there is no specific exemption in their case, it may be found that the law against restraint of trade applies to the practice of the medical profession. Mr. Arnold contends the law applies to "services" as well as goods.

The Arnold move will probably be widely popular with those who believe that opposition to group medicine and group hospitalization is short sighted on the part of the medical profession, and that if the war on group medicine in the District went to the length charged by the Attorney General the bounds of legitimate self defense were exceeded. But the fairness of the use of this particular club is open to question, especially as long as there are awaiting attention so many charges of violation of the antitrust laws by combinations they were supposedly intended primarily to cover. Such prosecutions would be more prosaic, but they come closer to the intent of the law as commonly understood.

MEDICAL MONOPOLY

Indianapolis News, August 2

An amazing interpretation of the federal antitrust laws is implied in the announcement of the United States department of justice that it is preparing to bring suits against the American Medical Association and other medical societies for violation of the antitrust laws. Coming so soon after the national health conference at Washington, at which differences of opinion between the American Medical Association and the federal administration were expressed, the inference is that the administration has resorted to the antitrust law suit device to bring pressure to bear upon the organized medical profession for approval of the administration public health plan. An assistant attorney general said in a statement accompanying announcement of the suits that the department would consider a consent decree in event that the defendants in the suits decide upon voluntary cooperation. This means, in effect, that the department will not prosecute if the defendants say that they will desist from alleged violation of the antitrust law.

The attorney general's office alleges, in the suit singled out for a test, that the American Medical Association and the Medical Society of the District of Columbia have attempted to prevent the functioning of the Group Health Association, Inc., of the District of Columbia. This is an organization of about 2,500 government employees. It collects dues from the members and, in return, provides them with medical attention and hospital services. The department of justice alleges that the Medical Society of the District of Columbia has sought to dissuade its members from taking employment by this organization, that doctors who have taken this employment have found themselves barred from the staffs of Washington hospitals and that their professional liberty has been restricted by what the department of justice calls "organized medicine."

The medical profession has resisted such organizations as that named in the Washington complaint on the ground that they will result in inferior standards of medical service and will encourage the subservience of the medical profession to lay control under conditions which are strongly dominated by financial considerations. Some of these organizations are alleged to be formed primarily for the financial gain of the promoters. The department of justice does not seem to realize that in attacking medical societies as alleged monopolies it may be clearing the way for a monopoly of unusual danger because of its lay control. The case will be followed with interest because of its deep concern to the health of every one.

THE MEDICAL PROBE

Washington Evening Star, August 2

The Department of Justice, in announcing its proposal to initiate grand jury proceedings against the American Medical Association and the District of Columbia Medical Society, is relying on the assumption that the Sherman Act applies to a monopoly of professional services as well as a monopoly of goods.

That is a novel proposition and a judicial determination of its validity should be welcomed by the medical profession as well as by the courts. The extent to which government can or should regulate the professional work of doctors is a highly debatable proposition, and the first step in resolving it is the ascertainment of how far, as a matter of law, the government can go in that direction.

If the courts uphold the right of regulation it will then be incumbent on the Department of Justice to prove that the members of the medical organizations have in fact combined to do the allegedly illegal acts. Until that proof is forthcoming the public should endeavor to keep an open mind on the question and not become prejudiced against a profession on the strength of charges yet to be substantiated.

The department has suggested that it would recommend withdrawal of the grand jury action if the doctors would agree to sign a suitable consent decree eliminating the allegedly illegal practices. That is a proper attitude for the government to take, provided the grand jury proceedings are in no sense used as a "club" to compel the signing of such a decree.

While it is not likely that the officials of the medical societies will look with favor on the signing of a decree, they should be free to decide that point without being subjected to pressure or promises. The issues here at stake are too important to permit the development of a situation like that in Milwaukee recently, when a federal judge dismissed a grand jury after it had voted Sherman Act indictments against some automobile finance companies because he thought the Justice Department officials had used the grand jury as a device to force acceptance of a consent decree.

MEDICINE AT CROSSROADS

Boston Herald, August 2

The whole question of assuring the American people of adequate medical care, which was discussed at length at the recent Washington conference, has suddenly been focused on one point by the action of Asst. Atty.-Gen. Thurman Arnold in formally accusing the American Medical Association and the District of Columbia Medical Society of violating the federal antitrust laws. It is safe to predict that the settlement of the case will probably influence the methods of the practice of medicine in the United States for years to come.

The facts, at least as Mr. Arnold presents them, are simple. The Group Health Association, Inc., was voluntarily organized a year ago by 2,500 small-salaried government employees to provide themselves with medical care for a small monthly fee. When the association attempted to retain competent physicians, it found that the District of Columbia Medical Society had threatened to expel any of its members who might enter into an agreement with the association. It also discovered that the society had forbidden its specialist members to consult with physicians employed by the association, and that it had prevailed on several Washington hospitals to refuse admittance to the association's doctors. It is well known, as Mr. Arnold says, that the Washington episode is not unique, and that the medical societies have similarly opposed the organization of group medicine association and hospital insurance plans in several other cities.

If these ventures will inevitably lower the quality of medical care and the A. M. A. can demonstrate that certainty, it is on strong ground. Plainly we must not embark on any scheme which will impair existing medical standards. But if the A. M. A.'s objective is merely to freeze our present medical facilities into a state of permanence and to prevent the free and honest trial of new facilities, it is on exceedingly weak ground.

As it has been declared many times in recent years and as it now must be apparent to almost everybody, the very rich and the very poor today receive the best medical treatment. The rich can afford to engage the best physicians and surgeons. The poor can obtain free treatment—often from the same doctors—at a hospital or clinic. But the middle class, the people with incomes of from $1,000 to $2,500 a year, usually have great difficulty and frequently suffer real hardships in attempting to meet the cost of a serious illness. The group scheme offers them the opportunity of buying protection against the financial impositions of illness just as most of them now insure themselves against the loss of their homes by fire—through small monthly or yearly payments.

In reply to the antitrust charges, the A. M. A. has immediately revived the bogey of government regimentation and "social-

ized medicine." The essential point is that these voluntary, cooperative organizations—which nobody has to join unless he wants to—really promise to obviate the need of government subsidy and regulation.

Public funds and private charity already take care of the poor sick. Our present objective should be to forestall the necessity of caring for the middle class sick in the same way. Certainly from the taxpayers' standpoint it is much more desirable to encourage 2,500 government employees in Washington—or any other group of citizens—to finance their own medical care through a cooperative arrangement than to deny them that right and invite them to seek public or private assistance whenever they fall ill.

Mr. Arnold was careful to state in his opinion that he is not accusing the members of the medical societies of a moral offense. Indeed, he invited them as "persons of distinction and good will" to cooperate in ending the impasse "so that there may be free and fair competition between the forms of organization and the older types of practice." It is to be hoped that the A. M. A.'s Chicago office will dismount from its high horse and join with the humble laity in a search for the just and intelligent course.

A VERY BROAD INDICTMENT

Washington Post, August 2

In an unusual application of the Sherman Act, the Department of Justice proposes to move against the District Medical Society and the American Medical Association. Assistant Attorney General Thurman Arnold is persuaded that both have acted in monopolistic fashion in opposing the Group Health Association formed here among government employees.

Heretofore the function of the antitrust law has been to break up economic combinations acting in restraint of trade. In invoking it against a representative professional group many confusing considerations enter the picture.

The statement by the Department of Justice "interprets the law as prohibiting combinations which prevent others from competing for services as well as for goods." Under this broad interpretation it might be said that any move of organized medicine to debar quacks is potentially illegal. And it might further be suggested that the entire program of the National Labor Relations Board, founded on recognition of majority labor unions for collective bargaining, is perilously close to violating the Sherman act. An administration which lays great stress on the right of labor to organize should be doubly careful in suggesting that similar action by professional men may be open to legal question.

Despite doubts as to the law in Mr. Arnold's proposal, there is no question of its broad social significance. It will serve to advertise and intensify an issue which concerns intimately every citizen of the land. Possibly it may serve to clarify the main aspects of this issue, though an increase in acrimony seems more likely. The role of the GHA in the case is largely incidental. It represents merely a convenient example of the attempt to improve the economics of health, a movement which organized medicine has thus far done more to oppose than to foster.

Indeed, it seems doubtful whether the GHA can profit in any direct way even if the projected grand jury investigation should sustain the Department of Justice. The local hospitals might be forced to open their doors to the GHA staff. But probably so much antagonism would be cultivated by the court fight that GHA members could have little confidence in using the institutions. It needs only a very casual acquaintance with the medical profession to realize that its leaders are not the type of men who can be coerced into acting against ideals for which many of them make continuous sacrifices. And the intention of the American Medical Association to fight the issue is already abundantly clear.

In view of this situation Mr. Arnold's statement must be regarded as unfortunate, in spite of an obvious effort to assuage the sting in the indictment. And regret at the widening of the breach is strengthened by the recent signs suggesting that organized medicine was on the point of modifying its opposition toward the group health movement. Locally, the GHA president last week made a very reasonable peace offer to the medical society and, unless reports are greatly mistaken, a disposition to bury the scalpel has been developing among the latter's general membership. On a country-wide scale, the discussions of the National Health Conference summoned here recently are believed to have impressed organized medicine with its obligation to cooperate with rather than to block well meaning attempts to lower the cost of medical care.

Without the best medical leadership any efforts to reach the proper solution of the national health problem is doomed. It is to be hoped that no legal disputations will be allowed to obscure this cardinal fact.

MEDICAL MONOPOLISTS?

Baltimore Sun, August 2

In his statement of his intention to file complaint against the District of Columbia Medical Society on account of alleged efforts to thwart the growth of experiments in group medicine, Assistant Attorney General Thurman Arnold makes it clear that it is his purpose to make possible "free and fair competition between the new forms of organization and the older types of practice." He cites practices which he believes are in violation of the Sherman Act: exclusion from hospitals of doctors who serve members of group health associations and expulsion of such doctors from medical associations. He believes that similar action has been taken by medical societies all over the country, where cooperative groups have appeared.

Whether or not Mr. Arnold can prove his case and make it stand up as applicable under the Sherman law, he has undoubtedly added an interesting chapter to the intense debate on group medicine and state medicine now being carried on in medical circles throughout the United States. The doctors are passionately divided on the subject and in some localities the fighting is doubtless carried on without gloves. Although it is plain from Mr. Arnold's citation of statistics on the relation of health to income that he is friendly to an extension of public medicine, he can hardly be accused of unreasonable action in so far as he is attempting to maintain a competitive situation between the advocates of two forms of medical practice. A hospital is not usually the private property of doctors who hold one view of this question, and it is difficult to understand why doctors who disagree with them on economic matters should on that ground alone be barred from treating their patients in such institutions.

Mr. Arnold's statement and any proceedings that grow out of it ought at least to have the effect of bringing into public discussion the ins and outs of the debate now proceeding among doctors, the possible relation of professional standing and skill to willingness to participate in cooperative schemes for medical care, etc., etc. At any rate, it will be entertaining to observe the medical reaction to the charge that a learned society of professional men has employed practices "in restraint of *trade*."

SOCIALIZED MEDICINE?

Chicago Daily News, August 2

The announced intention of the Department of Justice to bring suit against the American Medical Association under the antitrust laws raises some interesting questions.

The department, according to the New Deal's new trust buster, Assistant Attorney General Thurman Arnold, thinks that the antitrust laws apply to the offering of services as well as to the production of goods. That, if we are not mistaken, is a new interpretation. The line between offering one's services and offering one's labor is hard to draw. If Mr. Arnold can make this new interpretation stick, will there not be a conflict between the Wagner act, which favors collective bargaining in the offering of labor, and the antitrust laws, which might then be twisted into a weapon against trade unionism?

Specifically, the federal government charges that the American Medical Association is conspiring to make group health plans impossible, by expelling from the association doctors who join in such plans, and by forbidding its members to aid patients

who subscribe to such plans. If it is true that the association does this, and does it in a spirit of opposition, not because it is seeking to maintain high ethical and technical standards in the profession, we think it is following a mistaken course. Mr. Arnold should produce the evidence.

But meanwhile, it is intimated that if the association will change its policy so as to encourage health plans in future, the government may drop its suit. Does this mean that the New Deal, in its continued mood of socialistic experiment, is bent now upon bringing about socialized medicine? If that is the real aim, the administration should say so plainly. Certainly the people are entitled to the best medical care that the science and devotion of the medical profession can provide. But is not the profession already giving such care? Every community has hospital arrangements for patients too poor to pay. Every conscientious physician and surgeon contributes some of his time without charge to the service of the poor, and does so quietly, as a matter of course. But we do not believe that the profession as a whole is in a mood to submit, even under pressure, to New Deal regimentation. And neither do we believe that the average American citizen is in a mood to let the government tell him, when he falls ill, which doctor he must have.

IS THERE A MEDICAL MONOPOLY?

St. Louis Post-Dispatch, August 5

An interesting and perhaps highly significant development in the debate over providing adequate medical care for all the people is the Department of Justice's announcement that it will seek a grand jury investigation in the District of Columbia into the activities of organized medicine. The department was convinced by its own inquiry, says Thurman Arnold, Assistant Attorney-General, that violations of the antitrust laws had occurred.

A workers' health cooperative, similar to many that have sprung up in recent years all over the country, is the center of the dispute. Members of these groups pay dues, in return for which they receive medical care when needed from physicians retained by the organization. Orthodox medical organizations have opposed such groups virtually wherever they have appeared.

In Washington, it is alleged, they attempted to stop operation of the cooperative by threatening its staff physicians, and even doctors who consulted with them, with expulsion from the District Medical Society. Group physicians were barred from practice in Washington hospitals, it is charged. Mr. Arnold views such tactics as "attempts on the part of one group of physicians to prevent qualified doctors from carrying on their calling."

Whether or not actual violations of the antitrust laws occurred, there is no disputing the fact that the actions of organized medicine—the American Medical Association and most of the state and local societies—in opposing various humanitarian health plans have on all too many occasions savored of efforts to safeguard a monopoly for their members.

Millions of persons in this country cannot meet medical bills for their illnesses, not to mention those for periodic examinations on which preventive medicine, the basis of a healthy nation, must depend. On the other hand, there are thousands of physicians who, despite this crying need for their services, are able to make only the barest of livelihoods. To bring demand and supply together is the motive of the plans that have been proposed, which include socialized medicine, compulsory health insurance, government subsidies and voluntary cooperatives.

Of all these, the cooperative is the most moderate, the solution least upsetting to the present system. Yet organized medicine opposes it as well, as was seen a few months ago in St. Louis when the local medical society sought to bring an ouster suit against the Missouri Pacific Hospital Association, which supplies medical services to that railroad's employees. Fortunately, the Attorney-General's office refused to institute the proceeding.

A ferment for better and more widespread health services is stirring among the people, as well as among many forward-looking members of the profession. A committee of 430 members, since grown to more than 1,000, last fall launched a formidable "revolt" to liberalize the attitude of the American Medical Association. The caliber of the men who signed this "medical declaration of independence" proves that the movement must be taken seriously. For instance, among St. Louis physicians on the original list were Vilray P. Blair, David P. Barr, the late Ellis Fischel, Borden S. Veeder, H. L. Alexander, J. Albert Key, Ernest Sachs, Fred Taussig, Evarts A. Graham and Sidney I. Schwab.

Many of the practitioners who oppose a change are undeniably sincere, but their arguments have been refuted in numerous foreign countries where various forms of practice designed to reach the masses at costs within their means are in successful operation, and without the deterioration of ethical standards or medical practices which our own alarmists predict.

A committee of health experts has recently urged an $850,000,000-a-year program of government public health activities. With such a vast scheme in the air, organized medicine isn't very smart in opposing the moderate cooperative plan, in which no subsidy is paid and no government interference exists. The sole ground for opposition seems to be "unfair competition," but the patient who benefits by a cooperative plan can give that plea little hearing, particularly since under competitive medicine fees are still at a point where an unexpected illness may be ruinous to an ordinary family budget.

The reply of the American Medical Association's president-elect, Dr. Rock Sleyster of Milwaukee, indicates no yielding in organized medicine's stand. He insists the A. M. A. "has the right to enforce certain membership requirements and expel members who fail to comply with them," and that "hospitals are private institutions and have the right to determine which doctors shall practice in them."

It is assuredly true that these rights exist, but invoking them against the health cooperatives and their staff physicians betokens a stand against progress, a closed mind against the enlightened experimentation without which medical economics, exactly like medical science, cannot advance.

Mr. Arnold's action may not disclose a "medical trust," but it should cast needed light on the efforts of standpat groups to block a long-needed reform. Punishment of any persons guilty of threats and coercion would be welcome, but better would be the awakening of a cooperative spirit in those who now oppose all changes in the private fee system.

REGULATION GONE MAD

Alton (Ill.) Evening Telegraph

It is announced that the trust busting part of the New Deal is to proceed with criminal action against representatives of the American Medical Association because that body is enforcing its rules against doctors, and in the control of hospitals recognized by the A. M. A. The announcement certainly caused a great surprise to the doctors who have regarded it as their own right to set up such rules and regulations as they deem best for the interests of their profession. The surprise over the announced criminal prosecution of the doctors was not limited to medical men but extended to practically all others. The question is, where can one expect the prosecution to be stopped? Will it take in representatives of all the voluntary associations of cults and crafts and professions which set up rules by which exclusion becomes the penalty for failure of a member to live up to them?

It is recalled that some time ago a suit came to a conclusion in which oil men were penalized for living up to rules and regulations designed for conservation of the oil business, promulgated by them at the very suggestion of a department of the federal government. There are other prosecutions in sight so that people who belong to trade organizations, or to any other groups, have come to be a bit shaky. Is there any reason why, if it is unlawful for such groups as the doctors to organize and make their rules, that it is not unlawful for organized labor to prescribe rules under which its services may be sold and fix

what working agreements will be acceptable? The pattern of the rules of the doctors and of the labor organizations is very much the same. Also the rules of the associations of special groups generally are very much alike in their working and their objects.

It does seem that the use of criminal prosecution is a poor way for the New Deal to persuade groups to accomplish what the New Deal desires. The difference lies in the fact that socialized medicine is strongly opposed by organized medicine, while it is being advocated by the New Deal, to the extent that criminal proceedings will be launched to make it possible.

The doctor has only his services to sell. He has no assets in his profession to leave his family when he becomes disabled or dies. He thinks he should be allowed to control his professional relations in his lifetime. In that last respect he is like every other person who has worked hard and accumulated something he regards as particularly, peculiarly his own by right of achievement. The lawyer with his bar association, the newspaper man with his A. N. P. A., the dentist with his dental society and other such groups are equally culpable with the doctor, not to mention all the unions in organized labor, all the churches and other religious groups—one and all are just as guilty, just as deserving of prosecution as the doctors, in so far as they may regulate the professions, limiting the actions, the relations of their members to the public and with each other.

The prosecution of the doctors is just another illustration of the madness of the course of the New Deal.

MEDICAL CARE PROBLEMS

New Haven (Conn.) Journal Courier, August 3

Probably what everybody needs most in the present state of the discussion of medical facilities for lower income groups is poise and calm. Assistant Attorney General Thurman W. Arnold has announced an intention of examining in a grand jury investigation the resistance which American Medical Association members and groups are said to make against operation of a group medical care plan among government employees in the District of Columbia. This is the most recent crisis in a debate running back now two or three years; much of it centering, indeed, in New Haven and the Yale Medical School.

Mr. Arnold is a believer in the usages of symbolism in government, having written two books to prove it. It is not at all unlikely that the grand jury investigation is intended symbolically to represent the national government's attitude toward the question of medical care. To conclude that the A. M. A. or its members or its affiliates will be found guilty of violation of the antitrust acts is certainly a long exercise in forward speculation. As Mr. Lawrence suggests in his dispatch this morning, Mr. Arnold may run afoul of statutes protecting labor unions; one thinks particularly of cases in which the antitrust acts were in earlier history sought to be brought to bear against labor unions.

But whatever the result of such litigation as the Department of Justice seems to propose, it is extremely unlikely that medical care plans, federal or otherwise, will get far without the cooperation of the doctors. The possession of medical skill, after all, is something of a private monopoly; the government cannot force doctors to serve against their will; and clearly will not wish to do so. This is no problem in the mobilization of wholly interchangeable laborers to man an assembly line in a mass production factory. No plan for medical care can prosper in the United States without the support of the best practitioners.

It is possible some of those practitioners have been narrow in their judgment of the problem. It is practically certain that narrowness has been overemphasized by critics of the organized profession. Nobody doubts that many competent doctors lack remunerative practice and that many individuals and many areas in the United States lack adequate medical care. The problem will not be settled by tub-thumping on either side. It must be settled in a way which will ensure general cooperation from the medical profession. The public may well demand of both sides toward that end an early meeting of the minds.

SOCIALIZED MEDICINE

Dakota Republican, Vermillion, S. D., August 4

The question of socialized medicine keeps showing up in the public prints. It is quite in line with the other experiments in socialization which the present administration is fostering, most of which are pitiful failures. A doctor working as a federal official on a stated salary would spend a few hours a day waiting on his patients, and the rest of the time making complicated reports for another army of clerks in Washington to file away. He would no longer take a personal interest in his clients, or strive unduly to advance himself in his profession. It is true that the present system works many hardships. The public funds take care of the medical needs of the indigent. The wealthy class can afford the luxuries of the best available medical and surgical attention, while to the great mass of people of moderate means a major illness in the family becomes something of a financial tragedy. But there are some things that money cannot buy, nor political chicanery provide. We like to think of the doctors we all know who will eat when they can, and sleep when their patients don't need them; men who will get out of a warm bed on a blizzardy night to follow a snowplow for miles to aid some sick or injured person. We have known what the kindly sympathy and thoughtfulness of the doctor can do when there is illness in the family. To say that our doctors are actuated solely by the hope of pecuniary gain is a libel. Such things as that would soon pass away under socialized medicine. Doctors would become mere hired help, putting in their hours, and looking ahead to annual vacations and eventual retirement pay. We want none of it.

AS OLD AS MEDICINE

Binghamton (N. Y.) Press, August 2

Announcement that the Department of Justice is about to initiate antitrust law proceedings against the Medical Society of the District of Columbia and the Amercan Medical Association sounds big and complicated. Big it is, but not complicated at all. It is just the same old business that started way back yonder.

The world was very young then but old enough to know something about the properties of roots and herbs. On the other hand, there was the school that believed in charms and exorcisms, the Shamans who were somewhat political in their viewpoint and who usually held something of a monopoly on the tribal doctoring.

Those boys never got along with the brewers of potions and extracts. In one form or another they have appeared all through the history of medicine. They clustered around the thrones of medieval monarchs and slowed down the development of medicine as a science. When things got hot they had a few heads lopped off; threw some of the struggling medicos of the Middle Ages into the gaol and dungeon. They were able to and did employ the leverage of government on the members of the profession with whose methods they did not agree.

It is unfortunate that coercive action of the type contemplated is being swung as a club over the head of the American Medical Association and its allied groups which have rejected the federal plan of state medicine. An honest division of opinion exists in the medical profession. The chief objection to state medicine which is entertained by thoughtful medical men everywhere is the danger of its control by the laity and the further reasonable belief that politics would get into it and break down medical ethics and medical standards.

In either or both instances the patient would suffer much more than the doctor.

There is room for plenty of argument on both sides, and both sides are recruited from vast numbers of medical men who are entirely honest in their convictions. They aren't being arbitrary about it. Even a great many of those who oppose the idea of state medicine because of its possible effect upon the patient, whose interest every doctor is bound to safeguard, cheerfully admit that the profession may have to give up some of its rights along with the business groups of the country.

In almost every state and county medical society the country over such honest division of opinion exists. Each side has its own idea of the proper diagnosis. Neither side has, up to now, thought the problem through fully to a point of reasonable solution.

But if coercive methods are employed by the federal government to drive the medical profession of the United States into submission a great many unpleasant things are likely to happen. Even those medicos who are inclined to go along with the administration's plan will resent being driven. There isn't anything in the world quite so stubborn as a doctor. He has to be that way becase his battle is with the most stubborn adversary of all.

So the decision to invoke antitrust laws against the medical profession with such obvious purpose is indeed unfortunate. It is to be hoped that the federal government will reconsider before the thing goes too far.

NOW IT'S THE DOCTORS

Wilkes-Barre Record, August 2

It was only a question of time. First the bar got it from the Roosevelt administration. The press got it and is still getting it. The clergymen were dropped like hot potatoes after they had been circularized with questionnaires on the New Deal and had answered according to their own liking but not according to the liking of the administration. Now it is the doctors who are being taken up to the public whipping post. Politely and with some apologies, it is true, but to be spanked, just the same.

American Medical Association has violated the antitrust laws, so charges the New Deal's justice department. A grand jury indictment is to be sought against the medical society of the District of Columbia and the American Medical Association on the allegation that they have expelled a member who cooperated with members of the staff of the Group Health Association, an organization of government employees formed for treatment of its subscribers. Generally the department holds that the District Medical Society, the American Medical Association and some of the officials of both of these organizations "are attempting to prevent this association from functioning."

It seems that the doctors may not have a union. When they combine, the department, in its own words, "interprets the antitrust law as prohibiting combinations which prevent others from competing for services as well as goods."

An assistant attorney general, possibly thinking that among the doctors were some New Deal voters, carefully explained that the department does not take the view that the offenses committed are crimes which reflect upon the character or standing of the persons who may be involved. He specifically declared there was an absence of moral turpitude. But the law is the law and must be obeyed.

Various polls have revealed that professional classes as a whole have had no enthusiasm for the New Deal. The accused doctors who are told in advance that their offenses are not "crimes which reflect upon the character or high standing of the persons who may be involved" should be grateful for this testimony to their character. The bar and the press have had to get along with less tender treatment.

MEDICAL 'UNIONISM'

South Bend Tribune, August 3

In some respects, as the Chicago *Tribune* points out, the medical associations resemble trades unions. They pass judgment on the personal and technical qualifications of persons in the medical profession, extend or withhold the association membership privilege on the basis of that judgment and strive to make nonmembership a serious professional handicap. The Chicago newspaper's observation that "there is no union scale for doctors" should be modified. The fees for services are fairly uniform in various communities, with appreciation of local conditions.

It is true, however, that "there are no union hours" for medical practitioners. No medical association has decreed a forty-four hour week for its members. The public, now that the issue has been intensified by political intervention, should weigh the fact that "the ablest medical men in every community give their services without pay to the poor as a matter of course." Many proponents of socialized medicine argue that the middle class, between the indigent poor and the financially well-to-do, suffers by the present individualistic medical system. The cooperative medical service group in Washington, D. C., on whose behalf the department of justice is intervening for a test case, consists of moderate salaried government employees and of physicians willing to incur medical association displeasure.

Members of the group, pledged to pay $2 to $3 a month for medical service whether or not the eventual service actually matches the financial outlay, obviously classify the individualistic system as a liability. Who is to blame? "Few doctors are rich," the Chicago *Tribune* comments, "and many an able physician earns little more than a bare livelihood." Official statistics confirm that. It is pertinent that physicians with distressingly small incomes—some actually have been on the dole in the larger American cities—devoted years and expended much money, meanwhile sacrificing opportunities to earn, for education for that profession.

The Chicago *Tribune* directs attention to the fact that no labor union has been prosecuted by this federal administration for repressive tactics more violent than those attributed to the American Medical association and its District of Columbia subsidiary. "Indeed," that newspaper recalls, "the labor board has repeatedly ordered the reemployment of . . . men guilty of rioting." When the ethical objectives of the American Medical association are given proper consideration it becomes plain that the federal government should be cautious in the impending proceedings. The welfare of the medical profession and the dependent public should have precedence. A "medical trust" investigation with the familiar flamboyant political trimmings designed to break down professional public resistance to the socialized medicine movement, already concrete in legislative proposals, might cause irreparable damage to public health over the long term.

PUTTING THE SCREWS POLITELY ON THE DOCTORS

New York Sun, August 1

The New Deal's Department of Justice has moved against the American Medical Association as a violator of the antitrust laws. Its offense, in brief, is that it has expelled one of its members who cooperated with members of the staff of the Group Health Association, an organization of government employees formed for treatment of its subscribers. It is also alleged that Washington hospitals have been shut against the doctors of the group.

A reading of the opinion of the department would be proof that Attorney General Cummings did not write it. Instead of his trustbusting style it has the soft, even pussyfoot, approach of his assistant, Thurman Arnold. Professor Arnold, while under orders to shake a club at the medical association, possibly remembered that some of its members, when they could reach the polls without neglecting the critical case of Mrs. Jones, voted for the New Deal. So he takes pains to explain that the offenses committed are not "crimes which reflect upon the character or high standing of the persons who may be involved." They have no more moral turpitude than a reckless driver who is a person of "distinction and good will in a hurry to meet his legitimate engagements." However, the Professor explains, the law says so and so and the Department of Justice must follow up.

The accused doctors may keep their silk hats on. They may also reflect that labor unions and farmers may combine but physicians must not do that. They may remember, too, that there is a strong current in the New Deal toward socialism, including socialized medicine. Professor Arnold's lecture on the high cost of medical treatment should amuse at least one veteran practitioner of this town who had 130 calls in a recent month and collected a total of $3 for his pains.

But the Washington doctors may as well prepare to be indicted. Their lawyers can read to the jury some of Arnold's touching assurances of their lack of moral turpitude.

NATIONAL HEALTH CONFERENCE AND ITS SUGGESTED PROGRAM

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MONTGOMERY, ALA.

Whether one is inclined to agree not at all, in part or in toto with the report of the Technical Committee on Medical Care of the Interdepartmental Committee to Coordinate Health and Welfare Activities recently submitted at the National Health Conference held in Washington, every thinking physician, because of its import and tremendous scope, should carefully study its entire content. Specifically, this committee makes five recommendations for coping with existing deficiencies believed to be existent in the Nation's health services:

Recommendation I calls for a pronounced expansion of activities in the fields of general public health, maternity and infancy health services, with particular emphasis on the ubiquitous enemies of mankind, such as tuberculosis, the venereal diseases, pneumonia, cancer and mental disorders. Such pretentious expansions, on a nation wide scale, will call for an additional annual expenditure by federal, state and local governments of some $365,000,000, and it is recommended that the federal government carry one-half the burden of this proposed expansion. In this recommendation one sees not only recognition but approval given to the principle of federal subsidies to states in perfecting and strengthening local health agencies in their efforts toward controlling and conquering diseases with which they, single handed, are unable to cope. This principle of federal cooperation with states in the health field is already smoothly and efficiently functioning, through the provisions of the Social Security Act with the United States Public Health Service and the Children's Bureau. The need on the part of states—at least most states—for such federal aid has been amply demonstrated during the short time in which the act has been operative. Thus far in the experiences and relationships of state health departments with the federal agencies dispensing the health provisions of this act, there has been little or no tendency to usurpation of the rights and prerogatives which should properly reside within states; in short, the cooperative, not the coercive, spirit has prevailed. In the more recent federal legislation, passed by the last Congress for the purpose of aiding states in stamping out a specific human scourge—the venereal diseases—one sees preserved these principles of cooperation both in the act itself and in the formulated policies of administration. It would seem, therefore, that through this approach of further broadening an already established policy of cooperation between existing federal and state agencies, working in unison and harmony, lasting good should be accomplished through intensified programs specifically aimed at such major and widely distributed problems as the venereal diseases, tuberculosis, malaria, cancer, the pneumonias and the like. As to the importance of the public health significance of these and other health problems, both public health workers and the medical profession are in accord. Should governmental agencies—federal and state—move toward making much larger sums available for these purposes, it is felt that the details of the machinery for satisfactory operation could readily be worked out between the medical profession and the official health agencies already existing and whose responsibility it now is to administer appropriations made for the protection of the public health. In truth, such is already the practice in many states.

Recommendation II calls for expansion of existing hospital facilities, which, in the committee's opinion, are ill adapted to the varying needs of people living under different social, economic and geographic circumstances. Here one sees a new venture by the federal government into a hitherto unexplored field and is prompted by an apparent utter inadequacy of hospital facilities, at many points and over wide rural stretches, to give hospital care for the necessitous and medically necessitous. This particular problem—either for general hospital facilities or for tuberculous or mental cases—is not an acute one in the larger urban centers or in the more affluent states for the reason that such governmental agencies, possibly more forward looking and progressive, have been able to finance these demands made by society. However, many states, one of which is my own, have not, largely because of financial impoverishment, moved thus far along. No doubt exists in my mind as to the urgency of this need, not only in his own state but also in many other states similarly circumstanced. Nothing approaching adequacy in the realm of hospitalization for the indigent or tuberculous case exists. One is reminded of Tantalus of Greek mythology fame, who, standing neck-deep in water and with luscious fruits dangling overhead, yet suffered death from starvation and thirst because of these vital things ever receding from his lips. This second recommendation not only takes cognizance of an unhappy state of affairs but proceeds even further by suggesting federal financial cooperation with states in remedying these defects. Should not such federal aid, extended to states and sanely administered by state agencies possessing the professional and technical knowledge necessary in this field, prove a wholesome incentive to them to do their full part in bridging over a yawning gap in contemplated nation wide plans for human betterment?

Recommendations III, IV and V need not here and now be discussed. The committee says: "The Committee does not suggest that it is practicable to put into effect immediately the maximum recommendations."

Might not, therefore, attention be focused on the principles embraced in recommendations I and II, for the administration of which, the machinery, in large part, already exists and in which, up until now, no thought of regimentation has been made manifest? Earnest and cooperative effort put forth by all concerned—not the least of which is the profession of medicine—should shed an abundance of light to guide further our faltering footsteps along a tortuous and difficult path.

MEDICAL ECONOMIC ABSTRACT

CHILD WELFARE SERVICES IN INDIANA IN 1937

The extent of cooperation of the Indiana State Medical Association and the Indiana State Dental Association in the welfare services, and especially in the care of child health in Indiana, is described in a survey of maternal and child health of the Indiana State Board of Health appearing in the May 1938 issue of the *Journal of the Indiana State Medical Association*. Seven committees of the state medical association have cooperated in carrying out the program. The Committee on Postgraduate Study has conducted a campaign of medical education throughout the state, and the Bureau of Publicity has arranged for approximately 450 health and dental lectures to the public. The State Dental Association has been responsible for a dental demonstration program, consisting of a complete dental office on wheels, which is stationed in selected areas for different periods and where dental care for all indigent children between the ages of 3 and 10 years is supplied free. The state medical association is conducting a study of the causes of infant and maternal mortality in cooperation with the Bureau of Maternal and Child Health.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

Society News.—At a meeting of the Pulaski County Medical Society June 6 Drs. Ellery C. Gay and Merlin J. Kilbury discussed surgical and pathologic topics respectively and Dr. John N. Compton, "Nicotinic Acid in Pellagra." All are from Little Rock.——Dr. Silas C. Fulmer, Little Rock, among others, addressed the Ouachita County Medical Society June 2 on diabetic coma.——A recent meeting of the Pope-Yell County Medical Society was addressed by Drs. John H. Moore, Delaware, and Charles R. Teeter, Pottsville, on diphtheria and sulfanilamide, respectively.——Dr. Elizabeth D. Fletcher discussed "Treatment of Dementia Praecox with Metrazol" before the Lonoke County Medical Society in Benton recently and Dr. Robert H. Foster, "The Insulin Treatment of Dementia Praecox."——The Tri-County Clinical Society was addressed in Prescott May 26 by Drs. Robert R. Kirkpatrick, Texarkana, on earache; Merlin J. Kilbury, Little Rock, some lesions of the cervix and uterus, and Joseph H. Sanderlin, Little Rock, the climacteric.

COLORADO

Gift of Medical Caricatures.—Forty-six caricatures of eminent men in medicine have been given to the library of the Medical Society of the City and County of Denver by Earnest C. Watson, Ph.B., professor of physics, California Institute of Technology, Pasadena. They are from the originals of those published in *Vanity Fair*, duplicates of which are to be found in the Royal College of Surgeons in London. They are said to comprise the only complete set in any library west of Chicago. The caricatures were presented to Dr. Samuel Fosdick Jones, Pasadena, Calif., a member of the medical society, who has been interested in the development of the library.

Licensure from National Board Required.—In view of the increasing difficulties of investigating the standard of medical colleges located outside the United States, its territories and insular possessions, the Colorado State Board of Medical Examiners, at its regular quarterly meeting in Denver, July 5, unanimously adopted the following resolution:

Resolved, That no graduate of a college of medicine located outside of the United States, its territories and insular possessions shall be permitted to take the examinations for medical licensure in this state unless he has first qualified before and become licensed by the National Board of Medical Examiners. He may make application to take the examinations for licensure in this state, provided he, at the time of making such application, files with this board a certificate of ability granted by the Colorado State Board of Examiners in the Basic Sciences. This resolution shall become effective immediately and shall apply to citizens of the United States as well as to citizens of other countries.

CONNECTICUT

State Medical Election.—Dr. Joseph I. Linde, New Haven, was chosen president elect of the Connecticut State Medical Society at its annual meeting in Groton June 1. Dr. Hugh B. Campbell, Norwich, was installed as president and Dr. Creighton Barker, New Haven, was reelected secretary. The next annual session will be held in New Haven in May 1939.

Annual Clinical Congress.—The fourteenth annual clinical congress of the Connecticut State Medical Society will be held in New Haven September 20-22. The speakers will include:

Dr. Grantley W. Taylor, Boston, Management of Regional Lymph Nodes in the Treatment of Carcinoma.
Dr. Nicholson J. Eastman, Baltimore, Pyelitis in Pregnancy.
Dr. Edward D. Churchill, Boston, Surgery in Pulmonary Disease.
Dr. Harry Goldblatt, Cleveland, Experimental Observations on the Pathogenesis and Treatment of Essential Hypertension.
Dr. Henry T. Chickering, New York, The Treatment of Pneumonia.
Dr. Cornelius P. Rhoads, New York, The Role of Vitamins in Health and Disease.
Dr. Samuel T. Orton, New York, Certain Disorders in Speech, Reading and Writing in Children and Some Resulting Behavior Disorders.
Dr. Thomas Duckett Jones, Boston, Rheumatic Fever.
Dr. Zacharias Bercovitz, New York, Diagnosis and Treatment of Ulcerative Colitis.
Dr. John Homans, Boston, Thrombophlebitis.
Dr. Harold G. Wolff, New York, Migraine and Its Treatment.

There will be symposiums, panel discussions, five minute talks and a short course on contraceptive devices. Many Connecticut physicians will be on the program, including members of the staff of Yale University School of Medicine.

DISTRICT OF COLUMBIA

Dr. Christie Receives Gibson Award.—Dr. Arthur C. Christie, formerly president of the Medical Society of the District of Columbia, recently received the second Dr. Frank E. Gibson Award in recognition "of meritorious contributions to medical science." The prize is presented by the Washington Medical and Surgical Society and is named in honor of Dr. Gibson, permanent treasurer of the society. Dr. Christie formerly served as professor of operative surgery and roentgenology at the Army Medical School, Washington, as professor of radiology, George Washington University Medical College, and as professor of clinical radiology, Georgetown University Medical School. He was president of the fifth International Congress of Radiology in Chicago in 1937 and has also held this office with the American Roentgen Ray Society and the American College of Radiology. He was born in Pennsylvania and graduated at the Cleveland College of Physicians and Surgeons in 1904.

FLORIDA

District Meeting.—The second annual meeting of the Northwest Medical District Society was held at the Yacht Club, Panama City, July 14. Dr. William J. Blackshear, Panama City, president of the Bay County Medical Society, gave the address of welcome. The speakers on the scientific program included Drs. Taylor W. Griffin, Quincy, "Black Widow Spider Bite"; Jesse N. McLane, Pensacola, "Chronic Maxillary Sinusitis Associated with Dental Caries"; Courtland D. Whitaker, Marianna, "Thoracectomy in Acute Empyema," and William C. Roberts, Panama City, "Obstetric Oddities Occurring in a Single Patient."

GEORGIA

Personal.—Drs. Noel M. Akers, Macon, and Guy V. Rice, Chillicothe, Texas, have been appointed health commissioners of Emanuel and Wayne counties respectively.——Dr. William B. Buckner, Moss Point, Miss., has been appointed health officer of Dougherty County, succeeding Dr. Thomas W. Collier, who resigned Sept. 3, 1937, it is reported.——Rev. William Doris O'Leary, S.J., has been appointed president of Spring Hill College, Mobile; before entrance into the Jesuit order, Father O'Leary was a practicing physician. He graduated from the University of Georgia School of Medicine in 1921.

ILLINOIS

Spotted Fever in Illinois.—The state department of health reports that eleven cases of Rocky Mountain spotted fever have been reported in Illinois so far this year against a total of eighteen cases reported in all previous years. Of the total this year one infection was known to have been imported, four were traced definitely to native tick bites and the remainder are believed to have been caused by native ticks. Four occurred in Johnson County and one each in Clay, Hamilton, Henry, McLean, Marshall, Morgan and Winnebago counties.

Chicago

Dr. Bellows Receives Ophthalmology Medal.—Dr. John Bellows, instructor in ophthalmology, Northwestern University Medical School, has been awarded the medal in ophthalmology of the University of Buffalo for his paper entitled "Biochemical Studies on the Crystalline Lens." The medal is given "for outstanding work in ophthalmology." Dr. Bellows graduated at the University of Illinois College of Medicine in 1930.

Civil Service Examinations.—The Civil Service Commission of the city of Chicago announces the following examinations, among others, on the dates indicated:

Chief sanitary officer, August 23; salary $6,500.
Chief medical officer, August 30; salary $6,500.
Bureau chief of communicable diseases; August 31; salary $5,000.
Medical examiner, September 7; salary $3,000.
Assistant medical superintendent, September 20; salary $3,000.

The commission reserves the right under the "subjects, special subject, duties, report of experience, or all of them, to impose oral or practical tests and tests of physical qualifications and health."

INDIANA

Director of Venereal Disease Control.—Dr. Wendall C. Kelly, Princeton, has been appointed state director for venereal disease control, effective July 1. Dr. Kelly has been in charge of a state health center in Princeton for Gibson, Posey, Pike and Warrick counties, where he will be succeeded by Dr. Wallace E. Childs, Madison. He graduated at Indiana University School of Medicine, Indianapolis, in 1936.

KANSAS

Society News.—Dr. Clyde O. Meredith, Emporia, discussed "X-Ray Pelvimetry" before a meeting of the Lyon County Medical Society in Emporia July 5.——The Tri-County Medical Society was addressed in Newton June 6 by Drs. Arthur Graham Asher, Kansas City, Mo., and Galen M. Tice, Kansas City, on "Hypertensive Heart Disease" and "X-Ray of the Gastrointestinal Tract" respectively.

Personal.—Dr. Louie J. Beyer, Lyons, has been appointed a member of the Kansas State Board of Regents for a term of four years.——Drs. Chester E. Joss, Topeka, and James A. Wheeler, Newton, have been appointed members of the Kansas State Board of Medical Registration and Examination for a term of three years each.——Newly appointed members of the Kansas State Board of Health include Drs. Roscoe T. Nichols, Hiawatha, and Bert Anderson, Victoria, and Mr. Howard Rooney, Dodge City, each for a term of three years.

LOUISIANA

District Meetings.—At a meeting of the Fifth District Medical Society in Monroe June 10 the speakers included Drs. Edwin A. Socola on "Banana and Banana Powder Therapy in the Diarrheal Diseases of Infants and Children"; Emmett L. Irwin, the gallbladder, and Thomas B. Sellers, office gynecology.——The Third District Medical Society was addressed June 27, among others, by Drs. Ambrose H. Storck on "Infections of the Foot and Leg" and Roy H. Turner, New Orleans, "Recent Advances in Vitamin Therapy."

Colonel Craig to Retire as Professor of Tropical Medicine.—Col. Charles Franklin Craig, medical corps, U. S. Army, retired, will retire as professor of tropical medicine and head of the department at Tulane University School of Medicine, New Orleans, September 1, and will then be appointed emeritus professor. Born in Danbury, Conn., Colonel Craig graduated at Yale University School of Medicine, New Haven, in 1894, and joined the army medical corps in 1898, becoming colonel in 1918. Among other positions, he was a member of the U. S. Army Board for Study of Tropical Diseases, Manila, from 1906 to 1907; assistant curator, Army Medical Museum, 1909-1913, and curator, 1919-1920; professor of bacteriology, parasitology and preventive medicine and director of laboratories, Army Medical School, 1920-1922; medical inspector of the Hawaiian Department, 1922-1926; commandant and director of clinical pathology and preventive medicine, Army Medical School, 1926-1930, and assistant commandant of the Army Medical Center, 1930 to 1931, when he became professor and head of the department of tropical medicine in Tulane. He was president of the American Society of Tropical Medicine, 1914-1915, American Society of Parasitologists, 1934-1935, and the American Academy of Tropical Medicine in 1935. He is associate editor of the *American Journal of Parasitology* and editor of the *American Journal of Tropical Medicine.*

MAINE

State Medical Election.—Dr. George L. Pratt, Farmington, was chosen president-elect of the Maine Medical Association at its annual meeting in Bar Harbor June 26-28 and Dr. Willard H. Bunker, Calais, was installed as president. Dr. Frederick R. Carter, Augusta, was reelected secretary.

Society News.—At a recent meeting of the Androscoggin County Medical Society Drs. Roland B. Moore, Portland, and Roscoe L. Mitchell, Augusta, discussed obstetrics.——Dr. Ernest Granville Crabtree, Boston, discussed recognition and management of urologic conditions before the Penobscot County Medical Society in Bangor recently.

MARYLAND

Dr. Katzenelbogen Goes to Washington.—Dr. Solomon Katzenelbogen, associate professor of psychiatry, Johns Hopkins University School of Medicine, Baltimore, has been appointed director of laboratories and research at St. Elizabeths Hospital, Washington, D. C. Dr. Katzenelbogen has also been in charge of the department of internal medicine at the Phipps Psychiatric Clinic. A member of the faculty of Johns Hopkins since 1928, Dr. Katzenelbogen has, among other things, served as head of the laboratory of internal medicine, Medical Faculty, University of Geneva, and chief resident physician of the Hospital Canton, Geneva, Switzerland. He graduated in medicine at the University of Geneva in 1918. His new appointment was effective July 15.

MICHIGAN

State Medical Meeting in Detroit.—The seventy-third annual meeting of the Michigan State Medical Society will be held at the Book-Cadillac Hotel, Detroit, September 19-22, under the presidency of Dr. Henry Cook, Flint. Out of state speakers before section meetings will include:

Dr. Fred W. Rankin, Lexington, Ky., A Combined Operation for Cancer of the Rectum (movie with sound effect).
Dr. Stanley J. Seeger, Milwaukee, Treatment of Burns.
Dr. Kellogg Speed, Chicago, Knee Joint Injuries Exclusive of Fracture.
Dr. Frederick J. Taussig, St. Louis, Lymph Gland Removal in Cervix Cancer: Technic and Results.
Dr. Joseph L. Baer, Chicago, Prolapse of the Uterus.
Dr. Albert D. Ruedemann, Cleveland, Endocrine Disturbances Pertaining to the Eye.
Dr. Oscar V. Batson, Philadelphia, The Surgical Anatomy of the Ear.
Dr. Charles A. Aldrich, Winnetka, Ill., Management of Critical Situations in Childhood Nephritis.

Included among the speakers at the general assemblies will be:

Dr. Frank H. Lahey, Boston, Management of Surgical Conditions of the Common Bile Duct.
Dr. Harold O. Jones, Chicago, Tubal Pregnancy.
Dr. Joseph E. Moore, Baltimore, Syphilitic Primary Optic Atrophy.
Dr. Henry A. Christian, Boston, Certain Cardiorenal Circulatory Correlations.
Dr. Ruedemann, Headaches and Head Pains of Ocular Origin.
Dr. Aldrich, Babies Are Human Beings.
Dr. Taussig, Common Lesions of the Vulva.
Dr. Seeger, Treatment of Burns.
Dr. Batson, Hearing and Deafness.
Dr. Jacob Arnold Bargen, Rochester, Minn., Management of the Various Types of Ulcerative Colitis.
Dr. William D. McNally, Chicago, Carbon Monoxide Poisoning.
Dr. Franklin G. Ebaugh, Denver, Obligations of the Medical Profession in Relation to Mental Health.
Dr. Frank E. Adair, New York, Recognition, Diagnosis and Treatment of Breast Cancer.
Dr. John E. Gordon, Boston, Field Studies in Scarlet Fever.
Dr. Henry F. Helmholz, Rochester, Minn., Application of Recent Advancements in Urinary Antisepsis to Private Practice.
Dr. Russell L. Haden, Cleveland, Clinical Nutritional Deficiency Diseases.
Dr. Speed, Unhappy Results in the Treatment of Fractures.
Katharine F. Lenroot, Washington, D. C., Federal and State Cooperation in Maternal and Child Health Services.
Dr. Robert D. Mussey, Rochester, Thyroid Gland and the Function of Reproduction.
Dr. Roy R. Grinker, Chicago, Newer Methods in Neurologic Diagnosis and Treatment.
Dr. Rankin, Recent Changes in the Teaching and Practice of Medicine.
Dr. Horton R. Casparis, Nashville, The Tuberculosis Program and the Practice of Medicine.
Dr. Allen Fiske Voshell, Baltimore, The Conservative Treatment of Orthopedic Conditions.
Dr. Howard Fox, New York, Treatment of Common Diseases of the Skin.

President's Night will be observed Wednesday evening, when the Andrew P. Biddle Oration will be delivered by Dr. Haven Emerson, New York, on "Public Health the Product of Individual Preventive Medicine." The speakers at the postgraduate convocation Tuesday evening will be Drs. James D. Bruce, Ann Arbor, on "The Challenge of Medical Service" and Morris Fishbein, Chicago, Editor of THE JOURNAL, "Social Aspects of Medical Care." A conference for interns and residents Monday afternoon will be addressed by Drs. Rosco G. Leland, director, Bureau of Medical Economics, American Medical Association, Chicago, on "Value of Medical Organization to the Physician and to the Public"; Louis Fernald Foster, Bay City, "The Place of the Michigan State Medical Society in the Young Physician's Life," and James M. Robb, Detroit, "Pitfalls of the Practice of Medicine—Practical Pointers." A symposium on the business side of medicine will follow this session. Dr. Harrison H. Shoulders, Nashville, Tenn., secretary of the Tennessee State Medical Association, will address the county secretaries' conference Tuesday evening.

MISSOURI

Personal.—Dr. Edwin Lee Miller, Kansas City, received a certificate of merit from the University of Missouri Alumni Association at a luncheon meeting of the Medical Alumni Association, May 3, in Jefferson City. Dr. Miller is the first person from the University of Missouri School of Medicine to receive this award, it was stated.——Dr. Richard B. Schutz, Kansas City, received the cash award presented by the committee on maternal welfare of the state medical society for the most appropriate article appearing in the state medical journal relating to obstetric care. The title of his article was "Bleeding in Pregnancy," published in September 1937. The award was presented at the annual dinner of the committee in Jefferson City May 2.——Dr. Frederick J. Taussig, professor of clinical obstetrics and gynecology, Washington University School of Medicine, St. Louis, has been appointed a member of the state cancer commission, succeeding the late Dr. Ellis

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Fischel, chairman. F. T. Hodgdon, Hannibal, a member of the commission, was designated acting chairman, it is reported. ——The council of the Missouri State Medical Association held a dinner in Jefferson City May 1 in honor of past presidents of the association.——Dr. Otto H. Schwarz, professor of obstetrics and gynecology, Washington University School of Medicine, St. Louis, was honored at a dinner May 21 in recognition of his twenty-five years as a teacher at the university.

NEW YORK

Society News.—Drs. Arthur J. Bedell and Arthur M. Dickinson addressed the Medical Society of the County of Albany June 22 on "Fundus Signs of Constitutional Disease" and "Perforation of Carcinoma of the Stomach" respectively.——At the seventh annual interstate summer meeting of the Medical Society of the County of Chautauqua July 27 the speakers included Drs. Abraham H. Aaron, Buffalo, on "Treatment of Selected Gastrointestinal Conditions from the Viewpoint of the General Practitioner"; Karl A. Menninger, Topeka, Kan., "Contributions of Emotional Factors to Physical Disease," and Frank H. Lahey, Boston, "The Newer Developments in Surgery."——Drs. Alvin R. Carpenter and Charles M. Allaben, Binghamton, addressed the Broome County Medical Society, Binghamton, June 14, on "Fracture of Scaphoid of the Wrist" and "Club Feet" respectively.

New "Long Range" Legislative Health Commission.—The governor has appointed a "legislative commission on a long range health program," consisting of nine legislators and four other members. With an appropriation of $15,000 to finance its work, the commission has been asked to work out a health program to improve and maintain the health of the people of the state. Following are members of the commission:

Senator Leon A. Fischel, New York, chairman.
Assemblyman Lee B. Mailler, Orange County, vice chairman.
Assemblyman Robert F. Wagner Jr., New York, secretary.
Senator Emmett L. Doyle, Rochester.
Senator Francis L. McElroy, Syracuse.
Senator Joe R. Hanley, Livingston County.
Assemblyman Warren O. Daniels, St. Lawrence County.
Assemblyman Nathaniel M. Minkoff, Bronx.
Assemblyman Meyer Goldberg, New York.
Dr. Thomas P. Farmer, Syracuse, representing physicians.
Mr. R. V. Rickcord, New York, representing employers.
Mr. Henry D. O'Connell, Rochester, representing labor.
Miss Elsie M. Bond, New York, representing the general public.

New York City

Medical Exhibits at the World's Fair.—In the news item in THE JOURNAL, July 30, page 457, listing the sponsors of medical exhibits at the New York World's Fair in 1939, the name of Ciba Pharmaceutical Products was inadvertently omitted. The Ciba firm is cooperating in development of the exhibit on heart disease and the exhibit on hormones. It was one of the first to assume sponsorship.

Society Sponsors Course in Effective Speaking.—A course in effective speaking, personality training and human relationships will be given by Augustus E. Califano under the auspices of the Medical Society of the County of Queens at the society's building, Forest Hills. An introductory session will be held Friday evening October 7, while the ten subsequent Friday evenings will be given over to the course. Additional information may be obtained from the medical society, 122 Queens Boulevard, Forest Hills.

Changes at Rockefeller Institute.—Appointments and promotions to take effect on or after July 1 were recently announced by the Rockefeller Institute for Medical Research. The following were promoted from associate to associate member:

Rene J. Dubos, Ph.D. — Dr. Rafael Lorente de No
Kenneth Goodner, Ph.D. — John B. Nelson, Ph.D.

The following were promoted from assistant to associate:

Dr. Albert Claude — William C. Price, Ph.D.
Joseph S. Fruton, Ph.D. — Dr. Charles V. Seastone Jr.
Dr. John G. Kidd — Dr. Joseph E. Smadel
Dr. Colin M. MacLeod — Philip R. White, Ph.D.

Max A. Lauffler Jr., Ph.D., was promoted from fellow to assistant. The new appointments include the following assistants:

Dr. Jorge Casals-Ariet — Dr. William F. Friedewald
Dr. Smith O. Dexter Jr. — Rollin D. Hotchkiss, Ph.D.
Dr. Thomas D. Dublin — Dr. Francis H. Wright

Dr. Paul B. Beeson has been appointed resident physician at the hospital and the following have been appointed fellows:

Mr. Mark H. Adams — Isabel M. Morgan, Ph.D.
Dr. Konrad Dobriner — Ernst Scharrer
Dr. Robert S. Dow

OHIO

Society News.—Dr. Eben L. Brady, Marion, was elected president of the Ohio Public Health Association at the recent annual meeting in Columbus and Dr. Charles A. Doan, Columbus, secretary.——The council of the Academy of Medicine of Cincinnati has approved the organization of a speakers' bureau to provide speakers on medical subjects for lay audiences; the committee on public relations will work out the details.

OREGON

State Medical Meeting at Timberline Lodge.—The sixty-fourth annual session of the Oregon State Medical Society will be held at Mount Hood Timberline Lodge, August 24-27, under the presidency of Dr. Charles T. Sweeney, Medford. The guest speakers will be:

Dr. Cyrus C. Sturgis, Ann Arbor, Mich., Coronary Artery Disease.
Dr. Don C. Sutton, Chicago, Principles of the Treatment of Heart Disease.
Dr. Alfred W. Adson, Rochester, Minn., Surgical Treatment of Hypertension.
Dr. Edward C. Moore, Los Angeles, Carcinoma of the Right Colon.

Among the Oregon physicians participating in the program are:

Dr. Egon V. Ullmann, Portland, The Prevention of Recurrent Herpes.
Dr. William Ronald Frazier, Portland, Treatment of Threatened and Habitual Abortion and Report of Two Cases.
Drs. Fred N. Miller and Marion G. Hayes, Eugene, Streptococcic Pneumonia of Mild Severity.
Dr. Charles D. Donahue, Eugene, Renal Tuberculosis.
Dr. Wilmer C. Smith, Portland, Further Observations on Fractures of the Carpal Navicular.

The guests will conduct round table discussions and Dr. Vernon A. Douglas, Salem, will preside at one for health officers. Entertainment will include the twelfth annual golf tournament, horseback riding and a mountain climb.

PENNSYLVANIA

Society News.—At a meeting of the Franklin County Medical Society in Chambersburg, July 19, Dr. Joseph H. Barach, Pittsburgh, spoke in the afternoon on "Underlying Principles and Treatment of Diabetes" and in the evening "A Medical Tour of South America."——At the annual meeting of the Lehigh Valley Medical Association at Pocono Manor July 21 the guest speaker was Dr. Rosco G. Leland, director of the Bureau of Medical Economics of the American Medical Association, Chicago, on "The National Health Survey and the General Subject of Medical Economics." Dr. Harvey P. Feigley, Quakertown, president of the association, gave his official address on "The Family Physician—His Future."

Philadelphia

Medical Officer Receives Navy Cross.—Lieut. Clark G. Grazier, U. S. Navy, formerly of Philadelphia and now stationed at Cavite, P. I., attached to the U. S. S. *Augusta*, was honored with the Navy Cross June 30 in recognition of his conduct when the gunboat *Panay* was sunk by the Japanese last December. Lieutenant Grazier was the only physician on the boat. In a report to the Secretary of the Navy Lieut. Commander James J. Hughes said that Dr. Grazier "displayed coolness, ability and resourcefulness with his treatment of the many wounded, both while under fire aboard ship and under very difficult conditions ashore." Dr. Grazier was graduated from Jefferson Medical College in 1931.

Pittsburgh

Personal.—Dr. Charles Edward Ziegler, professor of obstetrics, University of Pittsburgh School of Medicine, received the honorary degree of doctor of science at the annual commencement of Dickinson College; he graduated from Dickinson in 1896.——Mr. Harry B. Meller, managing director of the Air Hygiene Foundation of America and for many years in charge of air hygiene research at Mellon Institute, received the honorary degree of doctor of science at the University of Toledo June 13. Mr. Meller is also chief of the bureau of smoke regulation of the department of health.

SOUTH DAKOTA

Society News.—Dr. John Raymond Kleyla, Omaha, addressed the Seventh District Medical Society recently in Sioux Falls on "Recent Advances in the Treatment of Lobar Pneumonia."

Committee on Industrial Health.—A committee on industrial health has been appointed by the council of the South Dakota State Medical Association. According to the secretary of the association, the new appointees were selected on account

of their location in the larger industrial communities of the state. Included on the committee are Drs. Raymond W. Mullen, Sioux Falls; Robert J. Jackson, Rapid City, and Paul P. Ewald, Lead.

TENNESSEE

University News.—Dr. Andrija Stampar, formerly chief medical officer of Yugoslavia, lectured at the Vanderbilt University School of Medicine, Nashville, recently on "Rural Health Activities in China" and "Maternal and Infant Welfare in the Soviet Union."

Society News.—The annual meeting of the Upper Cumberland Medical Society was held at Red Boiling Springs June 7-8. Among the speakers were Drs. William D. Haggard and James A. Kirtley Jr., Nashville, "Studies in Gallbladder Diseases Based on 841 Operations"; Thayer S. Wilson, Gordonsville, "Hypertension and Its Management"; Herman Spitz, Nashville, "Milk Allergy"; Carl C. Howard, Glasgow, Ky., "The Value of Clinical Symptoms," and John T. Moore, Algood, "Sulfanilamide."——Dr. Cassius W. Friberg, Johnson City, addressed the Greene County Medical Society, Greeneville, June 7 on a proposed program for maternal welfare sponsored by the state medical association; Dr. Cecil B. Laughlin, Greeneville, spoke of "The Heart Case as a Surgical and Obstetric Risk."——Dr. Fred H. Albee, New York, addressed the Chattanooga and Hamilton County Medical Society June 9 on "Restoration of Blood Supply in Fractures of the Hip in Bone Graft" and "Restoration of Motion in Bony Stiff Joints."

UTAH

Plague Infection.—According to *Public Health Reports*, plague infection was found in seven fleas collected May 20 from fifteen desert wood rats, Neotoma desertorum, shot and trapped from eleven to fourteen miles northwest of Kanab, Kane County.

GENERAL

Society News.—The Central Society for Clinical Research will hold its eleventh annual meeting in Chicago at the Drake Hotel, November 4-5. Dr. Lawrence D. Thompson, 4932 Maryland Avenue, St. Louis, is the secretary.——The Clinical Orthopaedic Society will meet in Nashville October 7 and Birmingham, Ala., October 8. Dr. H. Earle Conwell, Medical Arts Building, Birmingham, is the secretary.

Medical Art Association.—Dr. Alfred Braun, New York, received the grand prize for the best piece of art in the first annual exhibition of the American Physicians' Art Association in San Francisco in June. Dr. Braun's work was an oil entitled "Portrait of an Italian." One hundred and ninety-six exhibitors displayed 559 pieces of art. Dr. Francis H. Redewill, San Francisco, was chosen president of the association at the recent meeting; Drs. Herbert L. Treusch, Atlanta, and Henry N. Moeller, New York, were named vice presidents; Max Thorek, Chicago, secretary, and Raleigh W. Burlingame, San Francisco, treasurer.

Association Does Not Sponsor Promotion of Infant Health.—Word has been received from Portland, Ore., that the Alys May Brown Production Company (no address is given) claims to represent the American Medical Association in conducting a baby health conference in conjunction with the 1938 national encampment of the U. S. Spanish War Veterans to be held at Portland September 11-15. The American Medical Association has no commercial agents for such purposes and disapproves in general such commercial promotions of infant health. For years the Association has been publishing record cards and instructions for the conduct of baby health conferences of a bona fide character. These are available only with the approval of the county medical society in the community where the conference is to be held.

International Pharmacopeial Commission.—At a recent session of the Health Organization of the League of Nations an international commission was appointed to promote uniformity of standards for potent medicines. Dr. Charles H. Hampshire, London, is chairman, and members are Prof. H. Baggesgaard, Copenhagen; Prof. V. E. Zunz, Brussels; Prof. M. Tiffeneau, Paris; Prof. R. Eder, Zurich; Prof. L. Van Itallie, Leyden, and Ernest Fullerton Cook, Pharm.M., Philadelphia. A representative from Russia was also to be appointed. The commission plans to compile a list of the more important medicines used throughout the world and to invite the pharmacopeial commissions in various countries to prepare model monographs, which when finally approved will be presented to the pharmacopeial commissions of the world in the hope that they may bring about uniformity in titles, definitions, descriptions, tests for identity and purity and methods of assay.

Doctors Wanted for Service in China.—The National Christian Council of China is appealing for six physicians at the earliest moment for war service in China. Six are asked for from the United States, four from Great Britain and two from Canada. Physicians answering the call should be unmarried, in good physical health able to endure the hardships of field service and have special experience in surgery if possible. Passage to and travel in China will be arranged. The remuneration is small, with the minimum term of service to be at least one year. The National Christian Council of China through its commission on medical work in cooperation with the several missions and the International Red Cross Committee will direct the work of physicians. The work will be almost entirely that of war relief. Inquiries should be addressed to Dr. Edward H. Hume, director, Christian Medical Council for Overseas Work, room 1109, 156 Fifth Avenue, New York.

Tennessee Valley Meeting.—Dr. Forrest S. LeTellier, Knoxville, Tenn., was elected president of the Tennessee Valley Postgraduate Medical Assembly at its annual meeting in Knoxville June 22-24. Vice presidents are Drs. Carlisle R. Petty, Lynch, Ky., and James F. Pate, Canton, N. C., and Dr. Jesse C. Hill, Knoxville, was reelected secretary. Among the speakers were:

Dr. Arthur E. Hertzler, Halstead, Kan., Nonsurgical Disease of the Stomach.
Dr. William H. Higgins, Richmond, Va., Medical Aspects of Neoplasms of the Lung.
Dr. Richard Kovacs, New York, Of What Use is Physical Therapy for the Private Practitioner?
Dr. David T. Smith, Durham, N. C., Diagnosis and Treatment of Pellagra with Nicotinic Acid.
Dr. William D. Haggard, Nashville, Manifestations of Gallbladder Disease, with Analysis of 841 Cases.
Dr. Arthur U. Desjardins, Rochester, Minn., Radiotherapy for Inflammatory and Malignant Conditions.
Dr. Edward Julius Stieglitz, Chicago, The Application of Renal Function Studies.
Dr. Francis C. Grant, Philadelphia, Operative Procedures for the Relief of Pain.

Dr. Louis A. Buie, Rochester, Minn., spoke at a banquet on "The Featherless Peacock."

American Board of Plastic Surgery.—Announcement is made of the establishment May 23 of the American Board of Plastic Surgery as a subsidiary of the American Board of Surgery. Officers are Drs. John S. Davis, Baltimore, chairman; George M. Dorrance, vice chairman, Philadelphia; Vilray P. Blair, secretary-treasurer, St. Louis. Members are Drs. James Barrett Brown, St. Louis; Robert H. Ivy, Philadelphia; Harold L. D. Kirkham, Houston, Texas; William S. Kiskadden, Los Angeles; Sumner L. S. Koch, Chicago; William E. Ladd, Boston; Gordon B. New, Rochester, Minn.; George Warren Pierce, San Francisco; Ernest Fulton Risdon, Toronto, Canada; Ferris Smith, Grand Rapids, Mich.; Jerome P. Webster, New York, and John M. Wheeler, New York. The objectives of the board are to issue a certificate of qualification to all those meeting the board's requirements of training in plastic surgery; to conduct examinations for those candidates who meet its requirements and seek its qualifications; to improve and widen the existing opportunities for the training of the plastic surgeon; to study and evaluate local and foreign teaching centers and opportunities for experience in and the study of plastic surgery. The term of membership on the board will be for six years, except in the instance of the original board's membership which shall be for six, four and two years respectively. Two types of certificates will be issued: covering the general surgical field or one or more special fields. Two groups of candidates will be recognized: those to be certified without formal examination as to professional qualification and those to be formally examined. The former will be known as Founders. This group will include those invited by the board to make application and those who, submitting their applications within two years from the date of the beginning of operation of the board, have received the approval of the examination committee, have met the requirements of the Founders group and who, at the time of the board's organization in addition to possessing satisfactory moral character and ethical standing in the profession are generally accepted as technically prepared to do work of satisfactory quality in this field. All candidates eligible for examination must possess the preliminary and basic medical qualifications accepted by the Advisory Board of Medical Specialties of the American Medical Association. The qualifying examination will be divided into Part I, written and Part II, oral and practical. Part I will deal with the theory and practice of plastic surgery in the field in which certification is asked and include questions on

the management of local and general anesthesia, shock, hemorrhage, the handling of tissues and related bacteriology and also surgical accidents. Part II will include the exhibition of patients who have undergone or are undergoing treatment; examination, diagnosis and presentation of a plan of correction by the applicant of cases provided by the examiners; oral examination of the applicant and observations made in the operating and treatment rooms and wards. The fee for Group A (Founders) will be $25, while the fee for Group B will be $75, $25 to be payable on registration; $25 for Part I and $25 for Part II. Reexamination may be made as often as desired, provided one year elapses between examinations. The American Board of Plastic Surgery bears the responsibility of deciding who is fitted to do plastic surgery but a veto by the American Board of Surgery on any person will be either accepted by the former or made the occasion of a conference of representatives of the two boards.

CANADA

Canadian Medical Election.—Dr. Frank S. Patch, Montreal, was elected president of the Canadian Medical Association at the annual meeting in Halifax in June and Dr. Kenneth A. MacKenzie, Halifax, was installed as president. The next annual session will be held in Montreal.

British Columbia Meeting.—The forty-sixth annual meeting of the British Columbia Medical Association will be held at the Empress Hotel, Victoria, B. C., September 15-17. Lectures by seven guest speakers will constitute the program, as follows:

Dr. Hans Lisser, San Francisco: Masculinizing Syndromes; Clinical Observations on the Present Status of Gonadotropic and Sex Hormone Therapy; Indications for and Proper Use of Thyroid Substance.
Dr. Edwin G. Bannick, Seattle: Acute Pancreatitis; Medical Treatment of Severe Burns.
Dr. William Boyd, Toronto: Pathology of the Gallbladder; Tumors of the Neck; Bacterial Infection of the Heart.
Dr. Alson R. Kilgore, San Francisco: Treatment of Peripheral Vascular Diseases Threatening Gangrene; Extra-Abdominal Diseases Simulating the Acute Abdomen; Practical Considerations in the Handling of Acute Appendicitis and Its Complications.
Dr. Alfred T. Bazin, Montreal: Cancer of the Breast; Cancer of the Colon and Rectum.
Dr. Kenneth A. MacKenzie, Halifax, N. S., Treatment of Hypertension.
Dr. Louis H. Newburgh, Ann Arbor, Mich., Nature and Management of Nephritic Edema.

LATIN AMERICA

Tuberculosis Campaign in Cuba.—The Cuban government has appropriated a million dollars for a health program in which an intensive campaign against tuberculosis is being developed under the supervision of Dr. Wilson G. Smillie, Dr. Edgar Mayer and Morton C. Kahn, Ph.D., of Cornell University Medical College, New York. Clinics have been established in the state of Havana and in Oriente, staffed by experts in tuberculosis work, and it is planned to extend these clinics into all sections of Cuba. Adults as well as children are undergoing tuberculin tests, the survey being especially aimed at testing school children, food handlers and tobacco workers. Provision is already being made for hospitalization and treatment of those found to have tuberculosis. Renovation of L'Esperanza Hospital, near Havana, has made 800 beds available and another 800 will be furnished in a new hospital under construction in Trinidad, according to the *Bulletin of the National Tuberculosis Association.*

FOREIGN

Building for American Hospital in Turkey.—Construction will soon begin on a new building to house the American Hospital in Istanbul, Turkey, which, according to the New York *Times*, will cost $200,000 and be of reinforced concrete. It is made possible by contributions from American and other foreign residents in Istanbul, from friends of the hospital in the United States and chiefly from large American oil and tobacco companies with interests in the Near East. Rear Admiral Mark L. Bristol, retired, U. S. high commissioner to Turkey from 1919 to 1927, is president of the board of directors of the hospital in America. The director of the hospital in Istanbul is Dr. Lorrin A. Shepard, an American who was born in Aintab, Turkey, but received his medical training in American schools. The hospital, founded in 1890, has been quartered in a rented building. The new building will be in the Pera section of the city. W. Stuart Thompson, architect, New York, sailed July 16 to organize the work. The staff of physicians and interns is entirely Turkish. The Turkish government is cooperating fully with the institution because it operates a training school for twenty nurses. Under the direction of two American nurses, Turkish girls receive a three year training course and then go to government hospitals.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 20, 1938.

Annual Meeting of British Medical Association

At the 106th annual meeting of the British Medical Association, which took place at Plymouth, the president, Dr. Colin D. Lindsay, said that the credit of the general practitioner was sinking but that a reaction from that attitude was inevitable. The more the public was educated and the more health services extended into the lives of the people, the more would there be required an active and intelligent family doctor service. It would be no corps of clerks and would require a wide professional training to insure the early recognition of diseases and the proper coordination of specialized services, which were daily becoming more abundant. The amount of functional nervous diseases in the community was very large, and owing to the lack of any obvious disability, except in the later stages, it was only the general practitioner who could lead the attack. Medical psychology might well come into its own. Even now all general practitioners were to some extent psychotherapists. They would be much more effective if their training included some instruction in the principles of medical psychology. All direct contact with the public as individuals should be in the first instance through the family doctor.

At the back of the family doctor service there must be a specialist service. Medicine had grown so much that it was impossible for any one person to be proficient in every branch. However, the tendency to dissever the various organs of the body went too far. The family doctor was also a specialist, in the recognition of disease in its early stages and in helping in the many ills that beset his fellow men. The intensive search into the origin of cancer pointed to the probability that malignant growths rarely developed suddenly; there was a precancerous stage, usually lasting for years, in which cancer developed from minor ailments which might have been rectified if their significance and possible danger had been recognized. More attention should be paid to minor ailments. It had been estimated that 40 per cent of all illness was due to the patient's own action. If this was true, and he had found it so, a vast amount of sickness could be avoided. This required willingness on the part of the patient to talk over his minor ailments with his physician instead of using self medication assisted by the pharmacist. The general practitioner saw the beginning of disease, the specialist mainly the end. There was no reason why one branch should from its nature be more eminent than the other. They were essentially complementary, and each required attainments of the highest order.

Only through education of the public can credulity in regard to advertised remedies be removed. Because of the superstitious ignorance of the public there had grown up an enormous advertisement literature for remedies claimed to cure not only every known disease but also diseases invented for the purpose of being "cured" by some particular remedy. This trade could flourish only with a public which knew little or nothing. The health of the nation was now much in the public eye, and unless physicians guided the enormous amount of enthusiasm that lay behind the campaign there was danger that it might do more harm than good. They should go further than that. Teaching in elementary biology, anatomy and physiology should be an essential part of all education, however elementary.

THE PROBLEM OF REFUGEE PHYSICIANS

The political persecution in Germany and Austria has created a problem for the free countries, which was discussed at the representative meeting of the association. The number of foreign physicians admitted to the Medical Register in 1937 was

forty; twenty-eight have become members of the association. In 1938 so far the number is twenty-one. A deputation consisting of representatives of the Royal Colleges of Physicians and Surgeons, the Universities of Oxford, Cambridge and London, the British Medical Association and the Society of Apothecaries was received by the home secretary, Sir Samuel Hoare. He said that the position of physicians in Austria was lamentable and that something must be done by civilized nations to meet the emergency. The deputation felt that some gesture of humanity ought to be made by the medical profession and therefore suggested that a strictly limited number of physicians should be received after their claims had been investigated by a special advisory committee. It was also suggested that the senior men might work in laboratories supported by charitable funds and that the younger men before going into practice should be required to undergo specified training and examinations. Apprehension was expressed by some speakers at the representative meeting as to the results of admitting aliens first from one country and then from another. A strong appeal was made by one speaker on the score of humanity that refugees whose prospects had been dashed to the ground through no fault of their own should be given the privilege of going into certain British colonies to practice. The resolution was adopted "That the council be asked to give consideration to the effect on medical practice in the empire of the recent influx into this country of medically qualified aliens, and to report thereon."

RECOGNITION OF CHIROPODISTS

A resolution was moved rescinding one passed by the representative body in 1934 refusing official recognition to chiropodists in a more extended field than corns and callosities. It was pointed out to the representative meeting that the Incorporated Society of Chiropodists gave two years' training and that students were rigorously instructed as to the limits of their practice. They were forbidden to advertise or to use anesthetics and manipulative or operative treatment. The foot clinics were doing good work which could not be done by hospitals unless they had on their staff persons trained as chiropodists. The resolution had already been passed by the council of the British Medical Association by a large majority. They were fully alive to the difficulties; acceptance would mean departure in a small field from the principle that only those with a full medical training were capable of diagnosis. The resolution was opposed on this ground. It was pointed out that a similar claim was made by the sight-testing optician. In the sphere of diagnosis the chiropodist was to be left free, but in therapeutics the sphere was to be limited. On the other hand, it was argued that we should go on needing chiropodists and that this was an ideal opportunity to get control of their practice. The resolution was carried, as also was another requiring chiropodists to confine themselves to chiropody, which was defined as "the treatment of malformed nails and superficial excrescences occurring on the feet, such as corns, warts, callosities and bunions."

CONTRIBUTORY HOSPITAL SCHEMES

It was moved that as the Hospital Saving Association (which collects subscriptions from persons who may require hospital treatment) had hindered the normal development of private practice and that as similar results are likely to follow other contributory schemes the council be asked to review the whole position. The hospitals were much abused. A considerable number of the patients attending could afford to pay the fee of a general practitioner or consultant. On the other hand, it was pointed out that the Hospital Saving Association had advantages: (1) The contributors felt that they were being dealt with otherwise than by charity; (2) the family doctor could send his patient with a note to the hospital without fear that he was abusing the work of the hospital, and (3) every voucher had on it the British Medical Association limits of income. It was argued that the outpatient departments of the hospitals should be consultative departments only. The motion was carried unanimously.

SYNTHETIC HORMONES

In the section of medicine Sir Walter Langdon-Brown opened a discussion on organotherapy. The cooperation of organic chemists with biologists had led to the preparation of synthetic hormones, and it had been found that simpler chemical substances than those found in nature might be adequate to produce the biologic effect. These basal groups were, in Dodd's happy phrase, "skeleton keys which can pick the physiologic lock." We were still entirely without any conception as to why a particular cell should be sensitive to a particular chemical substance or why the same substance should augment the activity of one type of cell and inhibit that of another. Evans had shown that the response of the dachshund and the sheep dog to injections of the pituitary growth hormone were entirely different. Langdon-Brown expressed the hope that research on the synthetic hormones might effect two things: (1) the discovery of simple basal groups which could produce the biologic effect and yet escape disintegration by the digestive juices and (2) material reduction in the cost of production. At present the cost was prohibitive except for the very rich and for the hospital class.

AIR RAID PRECAUTIONS

Dr. G. C. Anderson, medical secretary, announced that in accordance with the request of the committee of imperial defense and with the help of an emergency officer in every division of the association a register of physicians had been drawn up. It listed 80 per cent of the members of the medical profession who volunteered their services in case of national emergency. The government had asked that the register be kept up to date. In the autumn those who volunteered would be asked whether their intentions still held and whether they would absolve the association from the understanding to keep their reply secret. With permission the authorities could be supplied with the names by area and by age group of those who were willing to volunnteer whether for services overseas or for air raid precautions. Mr. McAdam Eccles brought forward a motion asking for the appointment of medical committees on air raid precautions to assist municipal authorities if an emergency arose. In the event of war the younger physicians would be called up for military service, but those over 50 did not know exactly what they would have to do in case of emergency. In view of the information given by the secretary, Mr. Eccles withdrew his motion.

PARIS

(From Our Regular Correspondent)

July 16, 1938.

Monument in Memory of World War Physicians

The sanitary corps of the French army includes not only physicians but also dentists, pharmacists, nurses and other hospital aids. June 5 a monument erected at Lyons in memory of members of the corps who were killed or died while in service during the World War was dedicated by the prime minister, Mr. Daladier. A glowing tribute was paid to the work of the corps. Of 22,000 physicians practicing in France in 1914, over 18,000 were mobilized. At the time of the armistice there were 21,181 physicians in the sanitary corps. Ten per cent, or 2,108 of the physicians in service, died as the result of wounds or disease from 1914 to 1918. Of 3,821 pharmacists, 321 died; of 1,000 dentists, 142 died; of 5,238 hospital officials, 500 died; of 120,000 male nurses, 9,213 died, and of female nurses 600 died, 132 after air raids.

End Results of Mediastinal World War Injuries

Two papers read at the meeting June 1 of the Académie de chirurgie of Paris will be of great interest to military surgeons. Prof. René Le Fort of Lille was able recently to follow up fifty-five of ninety-three cases of injury of the heart and mediastinum, which he had observed during the World War. In four of these fifty-five cases operation had not been performed. The foreign bodies which were removed included thirty-two shell fragments, twenty bullets and two hand grenade splinters. In the majority of the cases operation had been done within three months after the injury. In fifty-one the pension received had averaged only 24 per cent of the former earning power, and in those in which missiles had been extracted from the heart (six cases) it had been only 30 per cent. The proportion of excellent end results was 57 per cent for the cases in which operation had been performed and 25 per cent for those in which no extraction took place. Professor Le Fort reported a case in which a mediastinal abscess had developed sixteen years after lodgment of a shell fragment near the root of the right lung. No operation for the removal of the foreign body had been performed at the time of injury. About five days after a recent drainage of the abscess and removal of the shell fragment the patient had severe hemoptysis and died. This case illustrated the potential dangers of expectant treatment. Small foreign bodies in the wall of the heart and in the hilus of the lung are well tolerated. It is advisable not to remove them, especially from the hilus, because of the risk of uncontrollable hemorrhage. Foreign bodies which are in one of the cavities of the heart should be removed regardless of the operative risks. Large foreign bodies should always be extracted, no matter where they are located in the heart or mediastinum. In general Professor Le Fort felt that his good end results justified the recommendation that an early operation was indicated.

The second paper was by Dr. Petit de la Villéon, warmly advocating removal of shell fragments and similar bodies under radioscopic control, but he was less radical in stating the indications for operation in cases of injury to the heart. In his opinion projectiles freely mobile in the cavities of the heart as well as those embedded in the wall of the auricles and right ventricles should not be removed. In the case of projectiles in the wall of the left ventricle, only those lying near the apex should be extracted and then only if at least 6 mm. of cardiac muscle is interposed between the ventricular cavity and the projectile.

BERLIN

(From Our Regular Correspondent)

June 18, 1938.

Public Health Service for 1937

The public health department of the ministry of the interior has published its report for 1937, a few months after the close of the year. The rapid assembly of so large a body of data must have entailed a vast amount of work. In the interests of expedition a preliminary report was issued, in which the more important observations are summarized; a few of these are herewith cited.

The number of marriages has increased ever so slightly, although the less numerous "war baby group" are now reaching the marriage age. The increase in the natality appears at present to have come to a standstill; a particular decline was conditioned by the influenza epidemic in the winter of 1936-1937. The number of births of second children has further increased by from 7,000 to 8,000 and the number of births of third children by from 5,000 to 6,000. The mortality seems to have remained on the whole fairly stationary during 1937, despite a manifest decline in the number of deaths from several specific causes. This constancy of the mortality is to be evaluated as a noteworthy advance, since it signifies an increase in the numbers of the higher age groups. The number of persons over the age of 60 increases yearly by more than 200,000; the proportion of this group to the population of the reich increases yearly by around 2 per thousand. Nursling mortality as well as the number of stillbirths has declined somewhat further. The fluctuations observed in the various causes of death among nurslings are interesting. In table 1 are set forth the number per thousand of living births and of deaths from various causes in the first year of life in the larger German cities.

TABLE 1.—*Causes of Death*

Year	Premature Birth	Nonviability	Premature Birth and Nonviability Combined	Endoenteritis	Syphilis
1935	16.62	16.96	33.58	5.99	0.38
1936	17.21	15.83	33.04	5.41	0.31
1937	16.87	15.13	32.00	5.72	0.21

Fatal syphilis of nurslings has become rare; its steady decline points to a recession of syphilis among mothers and among the population as a whole. A principal factor in the decline of nursling mortality is the diminution in the number of deaths from premature birth and nonviability (including malformations and obstetric accidents). Except in 1934 a decline of this type of early mortality formerly contributed scarcely at all to the decline of nursling mortality in general.

The figures for infectious diseases of childhood are also of interest. Those for the larger German cities are summarized in table 2.

TABLE 2.—*Fatalities from Various Diseases of Childhood*

Year	Diphtheria	Scarlatina	Measles	Whooping Cough
1935	2,369	342	337	320
1936	2,340	359	294	789
1937	1,800	290	274	488

Statistics for the entire reich on diphtheria and scarlatina are shown in table 3. After a progressive increase over several years, the incidence reached a high point in 1936 and declined during 1937, although the decrease in the number of cases of diphtheria was slight indeed. At the same time the mortality from both diseases underwent a decline in 1937 which was especially evident in the larger cities. The end of the year, however, brought with it an increase in these infections which surpassed the corresponding figures for the end of 1936.

TABLE 3.—*Statistics for Diphtheria and Scarlatina*

	Diphtheria			Scarlatina		
Year	No. of Cases	Morbidity per 10,000 of Population	Mortality per 100 Cases	No. of Cases	Morbidity per 10,000 of Population	Mortality per 100 Cases
1935	132,930	19.9	4.4	111,648	16.7	0.72
1936	147,029	22.0	3.8	123,674	18.5	0.72
1937	146,733	21.8	3.7	117,544	17.5	0.70

The incidence of acute anterior poliomyelitis has increased. The number of cases reported was 2,080 in 1935, 2,256 in 1936 and 2,723 in 1937. The morbidity per 10,000 of population rose from 0.31 to 0.40. The mortality per hundred cases amounted to 8.8 in the year 1935, 9.5 in 1936 and 11.9 in 1937. In the epidemic year 1932, nearly 4,000 cases were reported. The mortality from tuberculosis, which has shown an almost uninterrupted recession for many years, continued to decline during the past few years in the larger cities of Germany. In 1937 the rate was 6.9 per 10,000 of population, a new all time low. This recession has to do chiefly with pulmonary

tuberculosis. Statistics on lupus are now for the first time officially reported; the number of cases in the reich was 1,042; namely, 0.15 per 10,000 of population.

The incidence of typhoid, on the decline for several decades, increased slightly during 1937 (3,051 cases, against 2,894 in 1936), but this may be regarded as of no significance. Only the morbidity increased, not the mortality. The incidence of paratyphoid has in recent years approximated that of typhoid (about 3,000 cases annually). Conversely, the paratyphoid mortality (from 3 to 4 per cent) is only one third that of typhoid (the latter is from 10 to 11 per cent). The influenza morbidity was only 1.3 per 10,000 of population, against 1.9 in the year 1936 and 1.6 in 1935. Ninety cases of anthrax were reported as against sixty-eight in 1936. Twenty-two persons were taken ill with psittacosis, six of them fatally (as against fifty-three cases and eleven fatalities in 1936). No cases were reported of rabies, cholera, typhus, plague, smallpox or trichinosis. An increase was noted in the number of persons dying of cancer, diabetes, apoplexy and paralysis, heart disease and senile debility.

The incidence of suicides has remained unchanged (about 6,200 yearly). The number of accidental deaths per 10,000 of population has increased from three in the year 1935 to 3.3; namely, from 6,142 to 6,851. Chiefly responsible for the last-mentioned circumstance is the increase in the number of industrial plants and not the greater motorization of traffic; in fact, the number of street traffic accidents decreased in 1937.

The general state of national health and nutrition was considered satisfactory. There are a few exceptions, however. It is reported, for example, that because the peasants of Bavaria are reluctant to take advice and distrustful of the modern methods of nutrition, there is still a high incidence of nutritional disturbances, partly of a serious nature, among the nurslings of the region. Repeated reference is made to the dangers inherent in the increasing misuse of tobacco by the youth. The housing shortage has become exacerbated, owing to the immigration into industrial areas and the utilization of existing buildings for other than residential purposes. In particular there is a lack of dwellings of the smaller and smallest sizes, and many persons are still housed in structures such as barracks and shanties. The number of abortions declined during 1937.

At the end of 1937 there were 744 health departments in the German reich; of these, 655 were classed as federal boards under a national director, fifty as communal under a national director and thirty-nine as communal under a communal director. There were ninety-five special departments of eugenics and racial hygiene and twenty-seven bureaus devoted to other special fields. There were 22,265 persons in the employ of health departments, 10,701 (48 per cent) of them full time employees. About one third of the total personnel and more than one half (56.5 per cent of the full time personnel were women). Altogether 7,218 physicians were in the service of health departments. They serve as specialists in a great diversification of fields, principally pulmonary diseases, pediatrics, orthopedics, dermatology and venereology.

Advice with regard to marriage was dispensed to about 450,000 persons; namely, about 36 per cent of persons contracting marriage. About 30 per cent of all persons marrying received a governmental subsidy. Advice was dispensed to about 95,000 pregnant women; namely, about 7 per cent of the total. The number of special welfare centers for nurslings and young children was about 16,000. Advice was given with regard to the care of 1.25 millions of nurslings. More than 500,000 infants were entrusted to the health services. There were 276 school physicians on full time service and 4,477 not on full time. About 3.25 millions of school children underwent group physical examination. There were 5,146 school dentists (191 on full time, 4,955 not on full time). The health departments operated 1,477 special antituberculosis centers, as well as 456 similar establishments; these centers advised 1.25 millions of persons and made roentgenoscopic studies of an equal number and roentgenograms of 190,000. They sent 45,000 patients to sanatoriums and more than 14,000 to hospitals. The advisory centers for patients with venereal disease were 814 in number and dispensed advice to 200,000 persons. There were 420 advisory centers for orthopedic cases, at which 170,000 persons sought advice. There were twenty-four special advisory centers for patients with cancer and 285 other centers at which such patients received advice; 12,000 persons passed through these centers.

AUSTRALIA

(From Our Regular Correspondent)

June 29, 1938.

State Medicine in New Zealand

New Zealand is at present in the throes of working out a health insurance scheme to cover every member of the community. This scheme when it becomes law will mean the control of the medical profession by the state. To appreciate the medical situation in New Zealand, it is necessary to be acquainted with the general political background. New Zealand has been described as a totalitarian democracy. The declared policy of the present labor government is socialistic. As soon as it took office in 1935, legislation was introduced to give effect to election promises of increased wages and shorter hours and to lay the foundations for a completely socialistic state. Railways, public works, post and telegraph services, the police departments, electric power and all transport are now administered by the government. State control of the whole of the dairying industry has been established, housing schemes have been instituted, the national radio service has been placed completely under the control of a minister for broadcasting, and the establishment of a state iron and steel industry has just been authorized. For the government to complete its promises, it remains for it to introduce a national health insurance and superannuation bill before the next election, at the end of this year. The proposals are now being considered by a special parliamentary committee.

The scheme will be universal and will include dependents as well as wage earners, irrespective of income. At first only general practitioner and maternity services will be provided. Specialists and consultants will be brought in at a later date. General practitioners on the whole are enthusiastic about the scheme but specialists are opposed to it. The official criticisms of the British Medical Association in New Zealand are directed chiefly against the universal nature of the plan. To a socialist government, however, it is fundamental that a scheme should provide equal service for everybody. Only in this way can the division of patients into two classes be abolished, thus enabling doctors to give of their best to every one, without keeping an eye on the bank balance. The new schemes are to be financed partly by an increase in the wages tax of eightpence to 1 shilling in the pound, and what is now known as the unemployment tax will become the social security contribution. This will be subsidized on a pound for pound basis out of general government funds. At present it appears that some difficulty has been encountered in the progress of the scheme. This is probably financial rather than medical. Many people in New Zealand doubt the workability of the plan, and the actuary who carried out the preliminary calculations, now convinced of the inability of the scheme to function successfully, has resigned his position and left New Zealand.

Free Medical Service for Tasmania

Tasmania is experimenting in the formation of a state medical service which is freely available to all. Local authorities have been so impressed with the scheme that, in addition to the eight districts where it has been decided to place state

physicians, many other areas are negotiating with the government for a similar provision. The first physician appointed took up duties March 1. The original proposal provided for placing physicians in districts remote from medical aid, but in view of the fact that in many districts the administration of the local public health services was very casual the government decided to utilize the services of these as public officers. The state physicians to be located in these districts will be officers of the public health department and subject to its control. Each appointment carries a salary of from £600 to £850 per annum, according to the duties of the office and the area to be served, a house allowance of £50 per annum, and a gratuity subject to satisfactory service of £50 per annum payable at the termination of three years. Officers will be allowed one month's leave annually for a hospital refresher course and one month's annual leave on full pay.

The duties of the district health officers will include investigations into problems of sanitation, control of infectious diseases, regular and systematic inspection of all school children, control and protection of food supplies, supervision of private hospitals, the work of industrial hygiene and education of the public in the principles of public health and personal hygiene. Medical services will be free to all between specified hours at the physician's place of location and on his visiting days at various centers of population in the district. Except for his consulting hours at his place of residence and his visiting days to other centers, he will be permitted to charge and retain a consulting fee and to charge at the rate of sixpence per mile for motor car mileage. In the absence of such charges it is felt that free medical service would be abused by certain of the community. Medical attendance in maternity cases will also be free if patients are confined in either a private maternity home or a bush nursing hospital. If a district in which a physician is placed possesses either of these facilities and the patient does not utilize them, she shall be required to pay a fee for medical attendance, the object being to encourage mothers to utilize the hospital services in the interests of maternity and child welfare. Local committees of three will be constituted as a connecting link between the department and the local authority.

Placental Infection During Induced Labor

The many reports in the literature of Bacillus coli infections of the newborn and the frequency with which infection of the placenta by coliform organisms is associated with stillbirth and neonatal death have led Penfold and Butler of the Baker Institute of Medical Research, Melbourne, to believe that such infections of the newborn frequently arise from the contaminated placenta while the fetus is still in utero. They consider, moreover, that the surgical induction of labor may be important in such occurrences. They have reported the results of the bacteriologic examination of 114 placentas; in forty-six cases labor had been induced with the rectal tube, and in the remainder surgical induction had not been practiced. Placental infection was detected 2.5 times more often in the cases of surgical induction than in the other cases. More striking still was the difference in the nature of the infection. In the cases of tubally induced labor, B. coli, aerobic nonhemolytic streptococci and Bacillus welchii in the placenta were common. Mixed infections were also frequent. In cases of normal labor the placentas did not show any organisms of a characteristic fecal type, nor did they show any mixed infections. A prolonged interval between the induction of labor and the delivery of the child was found to increase the risk of infection of the placenta. Infection does not appear to be dependent to any great extent on the maternal condition or on the age of the fetus.

A high correlation was noted between placental infection and death of the child, mixed infections of the placental tissue and infections of the large fetal vessels of the placenta being especially serious for the infant. When the child was stillborn or died within ten days of birth, cultures similar to those made from the placenta were made from the heart's blood, spleen and lung and occasionally from the liver. Bacteria cultivated from these tissues were usually similar to those obtained from the placenta. When additional organisms are present in the fetus, their source is probably an infected liquor amnii. When B. coli was found in the placenta and in the body of the dead infant, the strains isolated were shown to be biochemically and serologically identical, suggesting a single disease process. A high correlation was observed between placental infection and maternal morbidity.

Marriages

WILBUR DEXTER JOHNSTON, New Haven, Conn., to Miss Susan Elizabeth Merritt of Americus, Ga., July 23.

CLARKE PAUL PENNINGTON, Vanceburg, Ky., to Miss Marjorie Marie Burns of Chattanooga, Tenn., recently.

ROBERT OWEN CANADA JR., Charlottesville, Va., to Miss Julia Dent Salter of Anniston, Ala., in July.

CARROLL VANCE WILLIS, Morehead City, N. C., to Miss Norma Lucile Askew at Snow Hill, June 5.

FLORENCE SULLIVAN HASSETT, Elmira, N. Y., to Miss Eleanor Rosalie Bingham at Saranac Lake in July.

GEORGE WILLIAM HERLITZ, Corona, N. Y., to Miss Muriel Kingdon Hellwig of Elmhurst, June 27.

FRANCIS BURTON BLACKMAR, Columbus, Ga., to Miss Elizabeth Ann Standard of Tignall, July 10.

ROBERT PEYTON VINCENT JR., Yazoo City, Miss., to Miss Jane Haas of New Orleans, July 20.

JAMES WILLARD COOMBS, Camden, Ohio, to DR. CHARLOTTE M. JOHNSON of Cincinnati, June 11.

GLEA VAUGHN STANTON, Limestone, Tenn., to Miss Cleo Dell Johnson of Memphis, July 17.

HAROLD LAWTON ROGERS, Albertville, Ala., to Miss Frances McKenzie in Fulton, Ky., in July.

JOHN WILLIAM BICK, New Orleans, to Miss Minnie Martha Walters in Biloxi, Miss., July 1.

KENNETH FRANKLIN HUGHES, Irving, Ill., to Miss Edna Doris of Mattoon, Ill., June 14.

THOMAS L. DOYLE, Philadelphia, to Miss Elizabeth Emerson of Bala-Cynwyd, Pa., July 5.

FRANK THOMPSON, Tanta, Egypt, to Miss Helen Day of East Orange, N. J., in July.

WILLIAM BRUCE NELSON, Fairfield, Ala., to Miss Edith Monroe of Marvel recently.

JAMES MAXEY DELL, Gainesville, Fla., to Mrs. Rose H. Eddins of New York, July 6.

MAURICE H. WEINSTEIN, Middletown, Ohio, to Miss Mary L. Morrical of Oxford in July.

JAMES WESLEY MCKINNEY to Miss Eleanor Trezevant, both of Memphis, Tenn., July 20.

JOHN J. MCDONOUGH to Miss Marie Alberta Nelson, both of Youngstown, Ohio, in July.

LA VERNE WILSON SWIGERT, Boston, to Miss Marjorie Helm of Evanston, Ill., July 23.

HOMER LAMAR HOWARD to Miss Dela Inez Bailey, both of Winona, Miss., in June.

ALEXANDER BRADFIELD, Detroit, to Miss Elda Mae Reese of Seaside, Ore., in July.

LYNN W. WHELCHEL to Miss Margaret A. Peters, both of Miami, Fla., June 18.

ALONZO LEE BEST, Newport, Ark., to Mrs. Norma Masters of Jonesboro, July 1.

ROBERT D. BICKEL, Roanoke, Va., to Miss Louise Bigony of Baltimore in June.

RUBEN B. BAUGH, Polkville, Miss., to Miss Flora Walrod in Raleigh, July 17.

MILTON M. ABELES to Miss Dorothy Cohen, both of New York, July 23.

BORIS PETROFF to Miss Ruth Gibbons, both of New York, July 25.

ZACHARY A. BLIER to Miss Evelyn Nauman, both of Chicago, July 7.

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Deaths

Frank Douglas Phinney ● Cincinnati; University of Pennsylvania Department of Medicine, Philadelphia, 1899; member of the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; on the staffs of the Bethesda Hospital and the Children's Convalescent Home of the Cincinnati Orphan Asylum and the St. Anthony Hospital, International Grenfell Foundation, Newfoundland; aged 64; died, May 30, of arteriosclerotic heart disease.

Robert Effinger Cumming ● Detroit; Columbia University College of Physicians and Surgeons, New York, 1917; member of the American Urological Association; fellow of the American College of Surgeons; aged 43; on the staffs of the Receiving Hospital, Grace Hospital, St. Joseph's Mercy Hospital, Highland Park General Hospital, the United States Marine Hospital and the Charles Godwin Jennings Hospital, where he died, June 23, of cirrhosis of the liver.

Joseph Pomeroy Widney, Los Angeles; Toland Medical College, San Francisco, 1866; also a minister; member of the California Medical Association; Civil War veteran; a founder and past president of the College of Medicine of the University of Southern California and dean and professor of medicine on its faculty for many years; was a member of the state board of health; for many years member of the city board of education; aged 96; died, July 4.

Wendell Stewart ● East St. Louis, Ill.; Washington University School of Medicine, St. Louis, 1930; member of the Radiological Society of North America; on the staffs of the Christian Welfare Hospital and St. Mary's hospitals, East St. Louis, and St. Elizabeth's Hospital, Belleville; aged 34; died, June 6, in the Barnes Hospital, St. Louis, following an operation for removal of a brain tumor.

James William Roberts, Atlanta, Ga.; Atlanta College of Physicians and Surgeons, 1913; member of the Medical Association of Georgia; assistant professor of clinical surgery at the Emory University School of Medicine; served during the World War; aged 52; on the staffs of the Crawford W. Long Hospital and the Emory University Hospital, where he died, May 4, of carcinoma of the lungs.

John Raymond Lehmann, Dallas, Texas; University of Pennsylvania Department of Medicine, Philadelphia, 1911; member of the State Medical Association of Texas; emeritus professor of therapeutics at the Baylor University College of Medicine; aged 58; died, May 30, in the Baylor Hospital, of cardiac decompensation, hypertension and left hemiplegia.

Josiah Travilla Bunting, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1894; assistant in otology, 1920-1924, and later instructor, Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania; veteran of the Spanish-American and World wars; aged 69; died, May 31, of cerebral hemorrhage.

John William McConnell, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; member of the Illinois State Medical Society; on the staff of St. Anne's Hospital; aged 64; died, May 10, in the Sacred Heart Sanitarium, Milwaukee, of coronary thrombosis.

Davidson Ker Texada, Alexandria, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1897; member of the Louisiana State Medical Society; formerly mayor; on the staff of the State Colony and Training School; aged 59; died, May 26, of coronary thrombosis.

Amos Carter, Indianapolis; Indiana Medical College, Indianapolis, 1878; member of the Indiana State Medical Association; at one time superintendent of the Indiana State Sanatorium, Rockville, and the Indiana Boys School Hospital, Plainfield; aged 85; died, May 30, of chronic myocarditis.

William R. Newton ● Cameron, Texas; Memphis (Tenn.) Hospital Medical College, 1899; past president of the Milam County Medical Society; state senator; fellow of the American College of Surgeons; part owner of the Cameron Hospital; aged 64; died, May 21, of coronary thrombosis.

Charles Lee Bailey, Hudson Falls, N. Y.; New York Homeopathic Medical College, New York, 1891; member of the Medical Society of the State of New York; veteran of the Spanish-American and World wars; aged 68; died, May 8, in a hospital at Albany of pneumonia.

William L. Starr, New Albany, Ind.; University of Louisville (Ky.) Medical Department, 1881; member of the Indiana State Medical Association; formerly county coroner and secretary of the city board of health; aged 79; died, June 4, of chronic myelitis and myocarditis.

Gabriel Eugene Tenaglia, Honey Brook, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1929; member of the Medical Society of the State of Pennsylvania; aged 33; died, June 10, in the Bryn Mawr (Pa.) Hospital, of carbon monoxide poisoning.

Amzi Weaver, New Albany, Ind.; Kentucky School of Medicine, Louisville, 1904; member of the Indiana State Medical Association; formerly superintendent of county schools; aged 64; died, June 6, of hypostatic pneumonia and cerebral embolus.

George L. Hume, Sherbrooke, Que., Canada; McGill University Faculty of Medicine, Montreal, 1898; fellow of the American College of Surgeons; surgeon to the Sherbrooke Hospital; aged 69; died, May 30, of coronary thrombosis.

Henry Hulse Seibert, Davis, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; aged 70; died, May 1, in the Evangelical Hospital, Freeport, of heart disease and pneumonia.

Prince Wolverton Byrd, Salem, Ore.; Willamette University Medical Department, Salem, 1911; on the staff of the Salem State Hospital; aged 53; died, May 30, in the Salem General Hospital of coronary thrombosis.

Fred Colman Nichols ● Santa Monica, Calif.; St. Louis University School of Medicine, 1904; on the staff of the White Memorial Hospital, Los Angeles; aged 56; died, May 27, in Glasgow, Scotland, of acute meningitis.

Austin F. Robinson, Baltimore; Southern Homeopathic Medical College, Baltimore, 1903; on the staff of the Union Memorial Hospital; aged 67; died, May 15, in Ruxton, Md., of lymphosarcoma and bronchopneumonia.

Thomas Aaron Klingensmith, Jeannette, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1890; member of the Medical Society of the State of Pennsylvania; aged 73; died, May 27, of cerebral hemorrhage.

Carl Emil Becker ● Philadelphia; Temple University School of Medicine, Philadelphia, 1912; formerly on the staff of the Lankenau Hospital; aged 76; died, May 9, of injuries received in an automobile accident.

Cortlandt William Dawe, Forest Hills, N. Y.; Cincinnati College of Medicine and Surgery, 1901; served during the World War; aged 56; died, April 1, in the Lewistown (Pa.) Hospital of pulmonary edema.

Thomas Cleaborn Bullock, Autryville, N. C.; College of Physicians and Surgeons, Baltimore, 1885; member of the Medical Society of the State of North Carolina; aged 74; died, May 27, of heart disease.

Harley Emmett Keyes, Pasadena, Calif.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; aged 61; died, May 22, of poison, self administered.

Charles Wesley Reed ● Grand Junction, Colo.; American Medical College, St. Louis, 1905; on the staff of St. Mary's Hospital; aged 62; died, May 31, in St. Anthony Hospital, Denver, of coronary thrombosis.

Henry C. Smith, Hackensack, N. J.; New York Homeopathic Medical College, New York, 1874; aged 85; died, June 6, in the Hackensack Hospital of pulmonary edema following strangulated hernia.

Henry Franklin Staples, Cleveland; Cleveland University of Medicine and Surgery, 1896; on the staff of the Huron Road Hospital, East Cleveland; aged 68; died, May 26, of retroperitoneal sarcoma.

David H. Oliver, Bridgeton, N. J.; Jefferson Medical College of Philadelphia, 1888; member of the Medical Society of New Jersey; aged 83; died, May 2, of cerebral hemorrhage and arteriosclerosis.

Charles Sylvester Mellen, Peoria, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; aged 58; died, May 25, of chronic myocarditis.

William Hackett Hines ● Kansas City, Mo.; University Medical College of Kansas City, Mo., 1912; aged 53; on the staff of St. Luke's Hospital, where he died, May 26, of cerebral hemorrhage.

Donald Wolpert Ward, Denver; University of Colorado School of Medicine, Denver, 1931; on the staff of the National Jewish Hospital; aged 34; died, May 18, in a local hospital of pneumonia.

Ellen Harris Heise, Huntington Park, Calif.; Northwestern University Woman's Medical School, Chicago, 1887; aged 90; died, April 13, of bronchopneumonia and arteriosclerosis.

Lloyd Moffitt ● Yakima, Wash.; University of Pennsylvania School of Medicine, Philadelphia, 1909; served during the World War; health officer; aged 53; died, May 2, of gastric carcinoma.

Charles Fischer Nall, Birmingham, Ala.; Meharry Medical College, Nashville, Tenn., 1918; aged 48; died, May 8, in the Provident Hospital, Chicago, of hypertension and nephrosclerosis.

Louis Max Turbin, Chicago; Chicago Homeopathic Medical College, 1891; aged 80; died, May 9, in the Ravenswood Hospital of injuries received when he was struck by a street car.

Allen J. Mason, Friendsville, Md.; Jefferson Medical College of Philadelphia, 1884; district school trustee and at one time mayor; aged 80; died, May 30, of coronary occlusion.

Lola Delores Clark Mighell Kenderdine, Des Moines, Iowa; State University of Iowa College of Medicine, Iowa City, 1894; aged 67; died, May 11, of coronary heart disease.

Joseph A. Harper, Wellston, Ohio; Columbus Medical College, 1892; formerly member of the city board of education; aged 78; died, May 19, of acute dilatation of the heart.

Joel Carl Dodson, Carthage, Miss.; Chattanooga (Tenn.) Medical College, 1905; Mississippi Medical College, Meridian, 1907; aged 57; died, May 15, of cerebral hemorrhage.

Xavier Dodel, San Francisco; Ludwig-Maximilians-Universität Medizinische Fakultät, München, Bavaria, Germany, 1882; aged 83; died, May 1, of coronary thrombosis.

Arthur Samuel Cornell, Grand Rapids, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1897; aged 65; died, May 28, of coronary thrombosis.

John Q. A. Clowes, Shelby, Ohio; Philadelphia University of Medicine and Surgery, 1869; aged 93; died, May 24, of organic heart disease and gangrene of the left foot.

Bertram Cameron Blackhall, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1935; intern at the Toronto General Hospital; aged 28; died, June 8.

Clinton Homer Day, Clarksville, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1900; aged 61; died, May 15, of cerebral hemorrhage and heart disease.

Henry A. Schneider, Owatonna, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1901; aged 61; died, May 7, of coronary sclerosis.

William E. Krumsiek, Granite City, Ill.; Hahnemann Medical College and Hospital, Chicago, 1891; aged 78; died, May 24, of myocarditis and mitral stenosis.

Thomas Frank Miles, Lorena, Texas; Tulane University of Louisiana Medical Department, New Orleans, 1884; aged 80; died, May 7, of carcinoma of the kidney.

Chalmers Craig, Johnstown, Pa.; Western Reserve University Medical Department, Cleveland, 1900; aged 67; died suddenly, April 5, of cerebral hemorrhage.

Stuart M. Yancey, Gainesville, Fla.; College of Physicians and Surgeons, Baltimore, 1886; aged 73; died, May 20, of arteriosclerosis and cerebral hemorrhage.

Jessie F. Buckley Ogden Seger, Wichita, Kan.; Keokuk (Iowa) Medical College, 1892; aged 76; died, May 24, in a local hospital of arteriosclerotic heart disease.

John Bell Fraser, Toronto, Ont., Canada; Trinity Medical College, Toronto, and Queen's University Faculty of Medicine, Kingston, 1888; aged 82; died, May 25.

George W. Toney, Piedmont, Mo.; St. Louis Medical College, 1880; member of the Missouri State Medical Association; aged 83; died, May 15, of heart disease.

Patrick S. Humphrey, Ashland, Ky.; University of Louisville Medical Department, 1891; aged 69; died, May 10, of arteriosclerosis and pernicious anemia.

William S. Williamson, Galesburg, Ill.; Jefferson Medical College of Philadelphia, 1889; Civil War veteran; aged 91; died, May 20, of cerebral hemorrhage.

James Henry Hatfield, Indianapolis; Hospital College of Medicine, Louisville, Ky., 1897; aged 64; died, May 10, of myocarditis and cerebral hemorrhage.

John Bell Dinsmore, Hillsboro, Ore.; University of Oregon Medical School, Portland, 1910; served during the World War; aged 55; died, May 5, of myocarditis.

Elisabeth Dehn Bayer, Agnew, Calif.; Northwestern University Woman's Medical School, Chicago, 1898; aged 70; died, May 26, of carcinoma of the uterus.

Erle W. Horswill, Palo Alto, Calif.; Eclectic Medical Institute, Cincinnati, 1908; aged 55; died, May 25, of lethargic encephalitis and bronchopneumonia.

Edward James Comerford, Pittsburgh; National Medical University, Chicago, 1909; also a pharmacist; aged 57; died, May 20, of cerebral hemorrhage.

Preston Theodore Rhoads, Howell, Tenn.; Vanderbilt University School of Medicine, Nashville, 1890; aged 75; died, May 7, of cerebral hemorrhage.

Elmer Thomas Davis, Modesto, Calif.; University Medical College of Kansas City, Mo., 1903; aged 70; died, May 9, of arteriosclerotic heart disease.

Aris D. N. Whitley, Monroe, N. C. (licensed in North Carolina in 1897); aged 63; died, May 31, in a hospital at Charlotte of aplastic anemia.

John H. Goggins, Jacksonville, Fla.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1916; aged 58; died, May 12, of diabetes mellitus.

William M. Smith, Van Wert, Ohio; Columbus Medical College, 1880; formerly deputy postmaster; aged 80; died, May 14, of cerebral hemorrhage.

Franz Emory Solier ● Bryan, Ohio; Long Island College Hospital, Brooklyn, 1907; aged 53; died, May 4, in a hospital at Toledo of acute hepatitis.

Esaias Nordgren, Des Moines; College of Physicians and Surgeons, Keokuk, Iowa, 1898; aged 68; died, May 17, of carcinoma of the left lung.

Duncan D. McCallum, New Dayton, Alta., Canada; University of Toronto Faculty of Medicine, Toronto, Ont., 1896; aged 71; died, May 6.

James William Webb, Hedley, Texas; Memphis (Tenn.) Hospital Medical College, 1903; aged 55; died, April 15, of coronary thrombosis.

Robert Richey, Hollister, Calif.; Marion-Sims College of Medicine, St. Louis, 1892; aged 71; died, April 1, of acute coronary thrombosis.

James L. McDowell, Central City, Ky.; Louisville Medical College, 1890; formerly mayor; aged 78; died, May 7, of cerebral hemorrhage.

John Ferrell Wood, Manitou, Man., Canada; Manitoba Medical College, Winnipeg, 1914; aged 52; died, May 7, of coronary thrombosis.

Kate Frances Ozmun Phillips, Shaker Heights, Ohio; Cleveland Medical College, 1893; aged 66; died, April 16, of cerebral hemorrhage.

Aaron Welch Edmiston, Omaha; Rush Medical College, Chicago, 1880; aged 81; died, May 29, of coronary thrombosis and arteriosclerosis.

Charles Hugh Wilcox, Fitzgerald, Ga.; Atlanta College of Physicians and Surgeons, 1901; aged 63; died, May 17, of coronary occlusion.

Gaston Edward Dudley, New Bern, N. C.; Meharry Medical College, Nashville, Tenn., 1928; aged 38; died, May 15, of cardiorenal disease.

Thomas Spotuas Burwell, Philadelphia; Jefferson Medical College of Philadelphia, 1907; aged 61; died, April 19, of coronary embolus.

James J. Upshaw, Hartsville, Tenn.; University of Louisville (Ky.) Medical Department, 1878; aged 80; died, May 7, of pernicious anemia.

Jesse Benjamin Manor, La Center, Ky.; Missouri Medical College, St. Louis, 1882; aged 83; died, May 20, of carcinoma of the prostate.

Roy Carlton Glann ● Bronson, Iowa; Sioux City College of Medicine, 1905; aged 59; died, May 24, of carbon monoxide poisoning.

Walter W. Fugitt, St. Petersburg, Fla.; Kentucky School of Medicine, Louisville, 1892; aged 72; died, May 13, of coronary occlusion.

Charles H. Martin, Baltimore; University of Denver Medical Department, 1885; aged 77; died, May 13, of chronic nephritis.

Arthur Thaddeus Perry, Camden, Tenn.; Mississippi Medical College, Meriden, 1910; aged 58; died, May 11, of heart disease.

Morgan M. Lane, Harviell, Mo.; Missouri Medical College, St. Louis, 1882; aged 80; died, May 4, of cerebral hemorrhage.

Alexander M. Tait, Blakesburg, Iowa; Keokuk Medical College, 1892; aged 86; died, May 28, in Wapello of senility.

Correspondence

NOMENCLATURE IN ACUTE POLIOMYELITIS

To the Editor:—The simple diagnostic term "poliomyelitis" (meningo-encephalopoliomyelitis) fails to portray different forms of a disease notable for the extreme variability of its clinical appearance. Recently the modifying terms "abortive," "non-paralytic," "preparalytic" and "paralytic" have been employed to designate the stage or severity of the disease. These terms are also vague and confusing. A diagnosis of "abortive" poliomyelitis is presumptive, without means of confirmation. Even if the virus is found in the nasopharynx or rectal washings in such "abortive" cases, it is still only an assumption that the virus was the causative agent of the indefinite illness, since healthy carriers have been described. The term "preparalytic" is objectionable because it conveys the idea that paralysis would inevitably ensue. Statistical studies have disclosed that such an outcome is not the rule. To avoid the use of "preparalytic," the term "nonparalytic" has been proposed. The term "non-paralytic" cannot be applied to an acute case of poliomyelitis because the development of paralysis, while not the rule, is only too frequent an outcome. Although the term "paralytic" is least objectionable, it too loses its value and is inaccurate as it is used at present to describe all cases with clinical motor involvement, from slight to extensive paralysis.

The term "epidemic poliomyelitis" should be definitely reserved to designate a disease produced by a distinctive virus. We recognize a definite clinical picture, which is correlated with the degree and extent of pathologic alterations in the spinal cord. The clinical diagnosis of "poliomyelitis" at present is based on (*a*) the prodromal signs and symptoms, which include headache, neck and back rigidity, and so on and (*b*) confirmatory and characteristic spinal fluid manifestations, which may or may not be associated with (*c*) muscle weakness or paralysis. The term "poliomyelitis" fails to convey any information other than the diagnosis, because of the fact that the disease is so variable.

The requirements of an ideal classification are to convey both an accurate picture of each case and the prognosis. The only method of accomplishing such an aim in this disease is by careful muscle examination and observations on the stage of the illness. We therefore propose the following classification for acute cases of poliomyelitis:

Stage		Degree	Extent
Early / Late	acute poliomyelitis	without paralysis with slight paralysis with moderate paralysis with severe paralysis with bulbar paralysis and paralysis	of extremity and muscle groups involved

A case will be one of "acute poliomyelitis" if the patient presents the symptoms enumerated above and is acutely ill.

The period of acute illness lasts from one to seven days, the average being four days. In general, a case in the first forty-eight hours of illness if paralysis is not present, or in the first twelve if paralysis exists, may arbitrarily be designated as "early acute." Thereafter it may be called "late acute." If any form of specific therapy is to be employed, it is probable that results will be modified by the stage of the disease in which the treatment is instituted.

The degree and extent of clinical paralysis can be determined only by a comprehensive muscle examination. Arbitrary standards must be selected here because of the individual variations which prevent the establishment of clearcut groups:

1. "Without paralysis" needs no discussion.

2. "With slight paralysis" should include patients in whom the involved muscles are capable of carrying out all active movements against gravity but in whom muscle power is so impaired that it is insufficient to overcome resistance offered by the examiner.

3. "With moderate paralysis" should be used to designate a degree of involvement in which good muscle contraction exists, so that partial to complete movement can be accomplished only when friction and gravity are removed.

4. "With severe paralysis" should include those cases in which muscle power is so diminished that no movement can be performed.

The extent of involvement can be indicated by stating the extremity and muscle groups involved, e. g. foot flexors, arm abductors, hip abductors.

A classification of this kind is more cumbersome, but it conveys a more accurate conception of the stage, nature and severity of the illness. Such a standard classification, if followed, lays the foundation for comparisons between epidemics in different places and at different times and might be of value in clarifying the effects of therapeutic measures. We believe that, in general, prognosis can be predicated from the use of such a classification; e. g., late acute poliomyelitis without or with slight paralysis usually make a good recovery, while patients acquiring a severe paralysis early in the illness have a poor outlook for significant recovery.

It should be pointed out that patients with poliomyelitis who have had subsidence of fever and other acute symptoms are no longer in the "acute" stage but are convalescent. Such "convalescent" cases should not be classified as suggested in the tabulation. They belong in a group which may be called "convalescent poliomyelitis," and the extent of the (then) final paralysis can be noted.

SIDNEY O. LEVINSON, M.D.
PAUL H. HARMON, M.D.
Chicago.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

GLAUCOMA AND COFFEE

To the Editor:—What is the present opinion regarding the use of tobacco, alcohol, coffee or tea for a patient with simple chronic glaucoma? I first noted trouble with reading about two years ago and went to several eye men, all of whom prescribed stronger glasses. The diagnosis of glaucoma was eventually made and pilocarpine prescribed. The first night of taking it I suffered an acute attack with all the textbook symptoms. About eight months ago I underwent an operation on my left eye (iridectomy) and later had a troublesome iritis striata. I am now using pilocarpine in moderation and have no trouble aside from an occasional attack of orbital pain, which usually yields to 20 grains (1.3 Gm.) of acetylsalicylic acid. I am still greatly troubled by the halos around lights and the only way I can shut them out is to instil sufficient pilocarpine to give me a pinpoint pupil. Wearing dark glasses only gives me more pain and lacrimation later. My pressure is now around 16 to 18. Will Sanka coffee hurt me?

M.D., New York.

ANSWER.—Opinion is not unanimous in the ophthalmologic profession as to the effect of stimulants such as tobacco and coffee on a glaucomatous eye. It is believed that such stimulants have a decided tendency to increase intra-ocular pressure, probably by vasodilatation within the iris and ciliary body. In fact, one of the provocative tests in eyes suspected as preglaucomatous is to have the patient drink two large cups of strong black coffee and then note the effect on the tension tonometrically registered. In possibly 15 per cent of the cases there is an increase in pressure of from 10 to 25 mm. of mercury within fifteen minutes. Consequently the average modern ophthalmologist warns his glaucomatous patients to abstain from coffee except in small amounts.

ALOPECIA AREATA

To the Editor:—A man, aged 27, in excellent general health, has had for many years two small hairless spots on the bearded region of his face. Last June they began to spread and similar areas appeared on his scalp. Complete physical examination and urinalysis were entirely negative. The basal metabolism was minus 14, so that thyroid in gradually increasing doses up to 3 grains (0.2 Gm.) daily was given for a time. The local lesion was diagnosed as alopecia areata by a competent dermatologist and treated with caustics to no avail. From June to September the hair of his scalp, which was always plentiful, had fallen out to such an extent that he was almost completely bald. The areas denuded were perfectly clean, showing no signs of inflammation or broken-off hair stumps. The face was practically free of hair. I referred the patient to another excellent dermatologist, who confirmed the diagnosis of alopecia areata and advised ultraviolet therapy, saying that local measures were of no avail. For some time I have been giving the patient weekly exposures of erythema doses of Alpine light, irradiating scalp, face and trunk. In spite of this, the alopecia is progressing. His eyebrows and eyelashes are now falling out, about half the hair has been lost from the forearms, and areas of alopecia are appearing on the thighs. The pubic and axillary hair are as yet intact. Is any other form of therapy worth trying? There are no foci of infection and the patient is of a very stable nervous temperament. The alopecia did not follow any known event, such as a nervous shock or infectious disease. Kindly give references on this subject.

M.D., New York.

Answer.—There is little that is known with certainty about the cause of alopecia areata. The important theories advanced to explain its presence are the infectious, toxic, neuropathic and endocrine.

Syphilis is said to be a cause or associated with the occurrence of alopecia areata by a number of competent observers. Epidemics have been reported from institutions for children. That certain chemicals and toxins are capable of inducing alopecia is shown by the action of thallium. Deviations from the normal activity of the thyroid and sex glands have been seen in association with loss of hair. Injuries to the head or acute anxiety may be causative.

The treatment which the patient received is of the kind usually used. Since the man's basal metabolism is below normal and good results not infrequently follow thyroid feeding, it should be continued. It is quite probable that the patient's alopecia is on an endocrine basis. Besides thyroid activity, investigations of other endocrine glands should be made. Anterior and posterior pituitary substance may be given by injection and by mouth. There is nothing wrong except for the alopecia, so all one can do is to apply empirical measures. Some local irritant and parasiticide may be applied, such as Cutler's fluid. This consists of equal parts of phenol, chloral hydrate and tincture of iodine. It is used once or twice a week, depending on the degree of the irritational response. Ultraviolet baths are an accepted form of treatment. Epilating doses of x-rays have been recommended. It is well to try one small area first to see how useful this measure will be. Mental depression should be combated and the patient's attention should be diverted from himself by engaging him in work or travel. In universal alopecia occurring in adults the prognosis is apt to be bad, but persistence in treatment is necessary if only to keep the patient hopeful.

References:

Ullmann, K.: Deliberations of Ninth International Congress of Dermatology **2**: 774, 1935.
Leipold, W.: *Dermat. Wchnschr.* **105**: 1259, 1937.

DIMETHYL SULFATE

To the Editor:—A patient is doing research work and is using dimethyl sulfate. What precautions should he take to prevent any poisoning? What would be the symptoms and treatment in case of poisoning?

George A. Bakke, M.D., Oakland, Calif.

Answer.—Dimethyl sulfate is one of the most toxic substances used in industry and should be manipulated only by highly skilled and experienced persons. Prosser White (The Dermatergoses or Occupational Affections of the Skin, Fourth Edition, H. K. Lewis & Co., Ltd., London, 1934, p. 312) states "Dimethyl sulphate . . . is extremely poisonous and one of the most dangerous substances used in the colour industry. Its vapour has a delayed action which ends in a burn, like that from sulphuric acid." Any person responsible for the guiding of workers handling this material should consult the references appended at the end of this brief comment. In general, it may be stated that dimethyl sulfate may be prepared by distilling a mixture of chlorosulfonic acid and methyl alcohol. The vapors from these substances constitute the chief source of injury, which may be either local or systemic. The local injury is one of an extensive caustic burn, varying from simple redness to extensive ulceration and necrosis. After absorption systemic disease may be manifest by convulsions, coma, paralysis, associated with marked vascular and renal disturbances. Changes take place in the blood characterized by polycythemia and leukocytosis. The temperature may reach high levels. The eyes are especially prone to injury from local action. By way of prevention and first aid the following is suggested:

Suitable rubber gloves should be worn whenever direct hand contact is possible. If exposure has taken place all clothing quickly should be removed and the body sponged with dilute acqueous ammonia. Immediate showers with water may be preferable. Mild alkaline solution should be utilized for flushing the eyes. Industrial operations should be carried out only in enclosed systems. If vapors are to be discharged from semi-enclosed systems, such discharges should take place from comparatively high stacks so that ample solution may preclude injury to persons in the neighborhood. In work rooms where accidents have arisen leading to prospective discharge of vapors into work rooms, all workmen quickly should leave the dangerous area. Workers suffering from or prone to suffer from inflammatory disorders of the eye or respiratory tract should not be employed for duties involving exposure to dimethyl sulfate. In general, the same degree of respect should be extended to dimethyl sulfate as to mustard gas.

References:

Occupation and Health, *Encyclopaedia of Hygiene, Pathology and Social Welfare*, International Labour Office, Geneva **1**: 565, 1930.
de Grosz, S.: Dimethyl-Sulfate Poisoning in Relation to Ophthalmology, *Am. J. Ophth.* **20**: 707 (July) 1937; abstr. *J. Indust. Hyg. & Toxicol.* **19**: 196 (Nov.) 1937.
Peterson, Haines and Webster: Legal Medicine and Toxicology, ed. 2, Philadelphia, W. B. Saunders Company, **2**: 795, 1936.
Leschke, Erich: Clinical Toxicology, Baltimore, William Wood & Company, 1934, p. 180.
McNally, William D.: Toxicology, Chicago, *Industrial Medicine*, 1937, p. 692.
Hamilton, Alice: Industrial Toxicology, New York, Harper & Brothers, 1934, pp. 177 and 237.
Kober and Hayhurst: Industrial Health, Philadelphia, P. Blakiston's Son & Co., 1924, p. 631.

TRICHOMONAS INTESTINALIS

To the Editor:—Please give possible drugs or other therapy for treatment of Trichomonas intestinalis infestation. A patient has been treated two weeks with enemas of warm salt solution and copper sulfate with no relief from diarrhea, abdominal pains or gross number of parasites microscopically. Is there any other organism that would be mistaken for Trichomonas intestinalis?

M.D., New Mexico.

Answer.—It is doubtful whether Trichomonas is a true intestinal pathogen, and other etiologic agents such as the dysentery bacillus must be eliminated.

There is no specific treatment for Trichomonas intestinalis infestation. Ratcliffe showed that four types of resorcinols when fed to rats which harbored Trichomonas in the intestine produced a rapid change in the intestinal flora so that one type of Trichomonas (muris) disappeared entirely and another type (parva) was reduced to 10 per cent of its original number. Ratcliffe also stated that a small number of human infections treated with N-heptyl resorcinols showed excellent results. Castellani recommended methylthionine chloride in 0.12 to 0.18 Gm. capsules three times a day by mouth, and bowel irrigations with from 1:3,000 to 1:5,000 solution.

Escomel considered turpentine almost a specific for intestinal trichomoniasis. He described two forms of therapy in his book "La trichomonosis intestinal." In the one that he prefers, for three days a tablespoonful of the following prescription is taken every two hours: pure oil of turpentine from 2 to 4 Gm., camphorated tincture of opium from 6 to 12 Gm., acacia 120 Gm., syrup of acacia 30 Gm. The diet is restricted to carbohydrates, and liquid ingestion is limited to rice water. In addition, from one to three enemas are given, alternating as follows: first an evacuating injection; second a retention enema consisting of four spoonfuls of boiled water, a beaten egg yolk, 10 drops of tincture of opium and from 15 to 30 drops of oil of turpentine. After three days of treatment the feces are examined. If Trichomonas is not found, treatment is stopped and the diet is gradually changed to normal. If Trichomonas is found, the treatment is continued until the organisms disappear. For cases that are resistant to turpentine, Escomel recommended compound solution of iodine, one part in 1,000 parts of water as an enema on each of three successive evenings.

Chiniofon has been recommended for Trichomonas intestinalis infestation as well as for amebic dysentery. It is given orally in doses from 0.25 to 1 Gm. in the form of pills or cachets three times a day. It is also administered rectally, from 1 to 5 Gm. freshly dissolved in 200 cc. of water at a temperature not above 44 C. This treatment may have to be continued for several weeks. Because of the iodine in chiniofon, care must be exercised in patients with thyroid disturbance.

It is rarely possible to confuse Trichomonas intestinalis with other organisms in the intestine.

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ESTROGEN IN URINE—NEGATIVE ASCHHEIM-ZONDEK TEST IN PREGNANCY

To the Editor:—Please give me the details of the urine examination for follicular and follicle-stimulating hormones. I should also like an explanation for the occasional negative Aschheim-Zondek test in a pregnant woman. What is the relationship of the presence of either the follicular or the follicle-stimulating hormones to pregnancy?

E. L. FITZSIMMONS, M.D., Evansville, Ind.

ANSWER.—Estrogen in the urine may be detected by the method of Kurzrok (The Endocrines in Obstetrics and Gynecology, Baltimore, William Wood & Co., 1937). This is a modification of the Allen-Doisy test for the production of estrous changes in castrated rats as evidenced by the production of a vaginal spread containing epithelial cells both nucleated and nonnucleated.

The gonadotropic factor is best detected by means of the Aschheim-Zondek test or the Friedman modification of this test. The latter is most widely used because of the relative simplicity of technic and the fact that using rabbits makes the gross observation of the test more satisfactory. For this purpose a previously segregated female rabbit is injected intravenously with 10 cc. of the suspect urine. The rabbit is examined twenty-four hours after the injection. The abdomen is opened and the ovaries are inspected. If the test is positive, hemorrhagic follicles or corpora lutea or both will be found.

The occasional negative Aschheim-Zondek test as obtained with the urine of a pregnant woman may be due to the presence of an insufficient amount of gonadotropin or to occasional refractoriness of the test animal. In the former case a subsequent test will be positive. One may avoid the latter source of error by retesting every animal that gives a negative test, using urine from a patient who is known to be pregnant. If this urine produces a negative test, the animal is refractory.

Gonadotropic substance makes its appearance in large quantities early in pregnancy and can often be detected within a week or ten days after pregnancy has taken place. It steadily increases in amount until about the fifth month of pregnancy, when it reaches a peak and begins to diminish. The amount of estrogen rises slowly in early pregnancy but continues to increase until term is reached. This explains why tests for detection of gonadotropin are of greater value in the determination of early pregnancy than are tests for estrogen.

CHROME DUST AND LUNG CANCER

To the Editor:—What is the possibility of continuous exposure to chrome dust (sodium dichromate) being the causative factor in carcinoma of the lung? Are there any references to this subject available?

W. H. LONGLEY JR., M.D., Jersey City, N. J.

ANSWER.—Several references are available dealing with lung cancer among chromate workers:

Teleky, L.: Occupational Cancer of the Lung, *J. Indust. Hyg. & Toxicol.* **19**:73 (Feb.) 1937.
Lehmann, K. B.: Ist Grund zu einer besonderen Beunruhigung wegen des Auftretens von Lungenkrebs bei Chromatarbeitern vorhanden? *Zentralbl. f. Gewerbepath. u. Gewerbehyg.* **9**:168 (Aug.-Sept.) 1932.
Pfeil, E.: Lungentumoren als Berufskrankung in Chromatbetrieben, *Deutsche med. Wchnschr.* **61**:1197 (July 26) 1935.
Alwens, W.; Bauke, E. E., and Jonas, W.: Auffallende Haufung von Bronchialkrebs bei Arbeitern der chemischen Industrie, *Arch. f. Gewerbepath. u. Gewerbehyg.* **7**:69, 1936; abstr. *München. med. Wchnschr.* **83**:485 (March 20) 1936.
Campbell, J. Argyll: Cancer of the Human Lung and Animal Experiment, *J. Indust. Hyg. & Toxicol.* **19**:449, 1937.

Teleky, in the paper cited, says: "Inhalation of chromate dust by workers in chromate factories produces a relatively high incidence of this disease [pulmonary cancer] and perhaps also of cancer of the digestive tract."

BACTERIOPHAGE THERAPY

To the Editor:—What is the present status of the so-called bacteriophage treatment of disease? I have in mind especially the use of this preparation in general peritonitis.

M.D., North Carolina.

ANSWER.—d'Herelle, who did most of the early work on bacteriophage, conceived of it as an ultramicroscopic living agent which produces a disease of bacteria ending in "lysis" or disruption of the cell. He believed that the introduction of the proper bacteriophage into the diseased host would result in mass destruction of the invading organisms. As a consequence of d'Herelle's encouraging views, innumerable clinical trials of bacteriophage therapy were undertaken. While many favorable reports followed, particularly in the early phases of clinical experimentations, the consensus of competent opinion now seems to be that bacteriophage therapy has no intrinsic value; i. e., bacteriophage injected into the patient does not effectively bring about bacterial destruction in tissue foci. The reason for this has been made clear by the studies of Krueger and Northrop and the more recent work of Krueger (see series of papers in the *Journal of General Physiology* from 1929 to 1937) on the mechanism of the bacteriophage-bacterium reaction. The primary difficulty seems to depend on two facts: 1. A certain high ratio of bacteriophage to bacteria is requisite for lysis. 2. The rapid production of bacteriophage requires optimal bacterial growth. Under ordinary conditions in a tissue, bacterial growth is far from optimal and is held in check by various mechanisms of host resistance and therefore little bacteriophage is formed (Krueger, A. P.; Lich, R., Jr., and Schultze, K. R.: *Proc. Soc. Exper. Biol. & Med.* **30**:73 [Oct.] 1932) and even that small amount is bound to a considerable extent by tissue colloids. Hence the critical lytic threshold value is seldom attained.

Krueger several years ago advanced proof that bacteriophage is a protein with the properties of an enzyme, and Northrop has recently confirmed this by isolating a protein which possesses all the properties of bacteriophage (*J. Gen. Physiol.* **21**:335 [Jan.] 1938). There seems to be no more reason to employ the term living in connection with bacteriophage than there is to use it with reference to an enzyme or a virus such as Stanley's tobacco mosaic virus.

There is no satisfactory proof that bacteriophage is of value in the treatment of peritonitis.

HEMOCHROMATOSIS

To the Editor:—A woman aged 29 with diabetes is beginning to have a definite bronzing of the skin, with hypotension. Her blood pressure ranges from 94/62 to 80/30. She has had one attack of diabetic coma. There is no evidence of cirrhosis of the liver or ascites. Does hemochromatosis ever occur in the female? Is it always accompanied by cirrhosis of the liver and ascites?

T. K. LEWIS, M.D., Birmingham, Ala.

ANSWER.—For the detection of hemosiderin in the urine a method often used is that of Rous (*J. Exper. Med.* **28**:645 [Nov.] 1918). It is outlined in Todd and Sanford: Clinical Diagnosis by Laboratory Methods, ed. 8, Philadelphia, W. B. Saunders Company, 1935, page 138. In the case cited it would be valuable to examine a section of the skin for iron pigment and excess melanin.

In Sheldon's monograph on hemochromatosis (London, Oxford University Press, 1935) an analysis is made of 311 "genuine" cases reported in the literature. Sixteen of these, or only 5.1 per cent, were in women. Cirrhosis of the liver is an essential feature of hemochromatosis in contrast to diabetes and bronzing of the skin, which may be absent. Ascites often occurs in the later stages of the disease; it was recorded in 22 per cent of Sheldon's series and he believes that the true frequency is much greater.

The most satisfactory way of diagnosing hemochromatosis during life is to excise a bit of skin from an abnormally pigmented region. The full thickness of corium should be included. The skin should be fixed in solution of formaldehyde or in alcohol, sectioned in paraffin, and stained by the technic recommended by Warren (Pathology of Diabetes Mellitus, ed. 2, Philadelphia, Lea & Febiger, 1938).

TREATMENT OF TAENIA SAGINATA INFESTATION

To the Editor:—I have as a patient a middle-aged woman infected with Taenia saginata. She has at various times taken the usual anthelmintics, including pelletierine and aspidium, without completely eliminating the parasite. Please suggest a satisfactory treatment.

L. MAXWELL LIDE, M.D., Florence, S. C.

ANSWER.—Aspidium has been a drug of choice for the treatment of tapeworm for a number of years. Frequent failures to remove the complete worm with this drug have been reported and are in part due to the method and dosage employed. Magath and Brown have standardized the aspidium treatment for tapeworm and report uniform success. (THE JOURNAL, May 14, 1927, p. 1548.)

Carbon tetrachloride was introduced for the treatment of tapeworms by Daubney and Carman (*Parasitology* **20**:185 [July] 1928). Owing to the simplicity of the method and its great efficiency, from 70 to 97 per cent of the worms being removed by one treatment, it enjoys wide usage. Treatment for an adult is carried out as follows:

To avoid the possibility of intoxication from carbon tetrachloride the patient should be put on a high calcium diet from ten days to two weeks before treatment, and no meat should be given for a day or so before or after the administration of carbon tetrachloride. A light evening meal should be taken, but a preliminary purge has been found unnecessary. In the morning, breakfast should be omitted and carbon tetrachloride given early.

Thirty Gm. of magnesium sulfate should be dissolved in half a glass of water and the adult dose of 3 cc. of carbon tetrachloride should be shaken up in this solution and swallowed. No breakfast should be allowed until the purge has acted. Following the action of the purge a warm soapsuds enema may be given and the stool examined for the head of the worm. Alcohol should not be taken during treatment.

ALLERGY TO MERCURY IN AMALGAM FILLINGS

To the Editor:—A woman has a skin eruption diagnosed by one skin specialist as "infectious dermatitis" and by another as an allergy against mercury. A skin reaction to mercury can be experimentally produced. She has a great many silver amalgam fillings in her mouth. Has an allergic reaction to the mercury in fillings been reported?

NITA MIETH ARNOLD, M.D., Chicago.

ANSWER.—Allergy to mercury is one of the most common causes of allergic dermatitis. The usual contact is one directly to the skin either by the handling of mercury compounds or by the use of medicaments containing mercury, such as antiseptics and mercury ointments. That sufficient mercury may be absorbed from amalgam fillings to cause mercury poisoning is evidenced by the numerous reports in literature, among which are the following:

Stock, A.: *Arch. f. Gewerbepath. u. Gewerbehyg.* **7**:388, 1936.
Stefensen, K.: *Ugesk. f. laeger.* **98**:855 (Aug. 2) 1936.
Herrenknecht, W., and Scheidt, C.: *Fortschr. d. Zahnh.* **6**:664 (Aug.) 1930.
Meyer, E.: *Med. Welt* **4**:703 (May 17) 1930.
Fluchel, A.: *Aertzl. Rundschau* **38**:309 (Oct. 25) 1928.

It stands to reason that, if sufficient mercury can be absorbed from amalgam fillings to produce mercury poisoning, the amount would be sufficient to produce inflammatory reactions of the skin if the patient happened to be sensitive to mercury.

Dermatitis can be produced by injection of mercury salts. A case is reported of dermatitis caused by the mercury in dental amalgam (Blumenthal, Franz, and Jaffé, Käte: *Deutsche med. Wchnschr.* **55**:1720 [Oct. 11] 1929).

There are undoubtedly other cases in the literature and many more unreported. Attention must be called to the fact that other metals also are used in dental fillings, and the possibility of dermatitis due to other metals must be kept in mind.

RIVERS' SMALLPOX VACCINE

To the Editor:—What is Rivers' smallpox vaccine and how is it used?

M.D., New York.

ANSWER.—Rivers' smallpox vaccine is prepared in modified tissue cultures consisting of minced chick embryo tissue suspended in Tyrode's solution. After cultivation, when the material has been shown to be bacteriologically sterile, it is mixed with sterile acacia solution, frozen and desiccated.

When desired for use, an ampule is opened aseptically and sterile water or salt solution is added as a diluent. After the material has been thoroughly mixed in the diluent, 0.1 cc. is given intracutaneously.

Reactions appear usually between the fourth and the tenth day after inoculation; seven days is the average length of time. As a rule no open sore develops and the reaction, which consists of redness and swelling, disappears within three weeks.

Reference:

Rivers, T. M., and Ward, S. M.: Jennerian Prophylaxis by Means of Intradermal Injections of Culture Vaccine Virus, *J. Exper. Med.* **62**:549 (Oct.) 1935.

INJECTION OF PROCAINE HYDROCHLORIDE FOR SPRAINS

To the Editor:—Is it considered good practice to inject procaine hydrochloride into a sprained knee as routine treatment? An osteopath nearby is doing this in order that children may continue to play basketball. I advised taping the sprained knee, with rest.

M.D., Colorado.

ANSWER.—A sprain of any kind indicates injury to supporting tissues. A sprained knee should be protected against reinjury and supported either by a splint or by adhesive strapping and an elastic bandage until the injured tissues have had time to repair. Injection of procaine hydrochloride into a sprained joint, to relieve the pain so that activity may be made possible, is a dangerous procedure. The pain which is present, after such an injury, is nature's way of warning the individual that damage has been done and that further activity producing the pain is increasing the injury. The local anesthetic simply paralyzes the warning signal and is as much a mistake as it would be to disconnect the burglar or fire alarm simply because the sound of it annoyed the owner of the establishment in which it had been installed.

EXCRETION OF BROMIDES

To the Editor:—Bastedo in his "Therapeutics" says that the bromides are slowly eliminated and that for weeks they may be detected in the urine and blood. How long would the effect last? How long would it be until the body would be entirely free from the effect of the bromism? I realize that this is a hard question, but bromides are used so freely in medicine that it must be important to those who use or prescribe them to know what the final result will be on the patient.

M.D., California.

ANSWER.—The kidneys excrete bromide [Br^-] less efficiently than iodide [I^-] and chloride [Cl^-], so that several days may be required to excrete the major portion that is in the body when the administration is stopped.

The rate and duration of excretion and the persistence of the effects depend on the original bromide level. With a single dose of 1 or 2 Gm., little effect remains after twelve to twenty-four hours; but with doses large enough to produce major toxic effects it may take a week till the bromide has fallen to an innocuous level. The excretion may be hastened by administration of sodium chloride. If a bromide acne or other dermatitis has started, this may take a little time to heal after the bromide level has fallen.

Traces of bromide may be detected in the urine for at least three weeks after its administration has been stopped but these quantities are too small to be significant.

FAMILIAL PERIODIC PARALYSIS

To the Editor:—In Queries and Minor Notes in THE JOURNAL, June 11, page 2026, appeared a discussion of familial periodic paralysis in which it was stated that no practicable treatment is available. Through my work dealing with the biochemical and physiologic role of potassium in the animal organism, I am acquainted with the literature of this mineral element. Recently two groups of investigators (Herrington, M. S.: Successful Treatment of Two Cases of Familial Periodic Paralysis with Potassium Citrate, THE JOURNAL, April 17, 1937, p. 1339, and Aitkin and his associates, *Clin. Sc.* **3**:47 [No. 1] 1937) have described a lowering of potassium in the blood serum in cases of familial periodic paralysis during the paralytic attacks and found that administration of potassium salts by mouth raises the serum potassium level and abolishes the paralysis.

ELSA ORENT-KEILS, Sc.D., Baltimore.

To the Editor:—Usually the answers published in Queries and Minor Notes are exceptionally authoritative and therefore I am presuming to call attention to a serious omission of information. In THE JOURNAL June 11, page 2026, in reply to a letter from a Massachusetts physician regarding two cases of familial periodic paralysis, the statement is made "There is no treatment known which is effective either in preventing this disease or in shortening its course." Is it possible that your commentator is not aware of the report of Aitken, Allott, Castleden and Walker (*Clin. Sc.* **3**:47 [No. 1] 1937) entitled "Observations on a Case of Familial Periodic Paralysis," in which the rational use of potassium salts is demonstrated? The confirmatory studies reported by Joseph Ferrebee, Dana Atchley and Robert Loeb at the thirtieth annual meeting of the Society for Clinical Investigation at Atlantic City this spring, as well as the more extended reports from the British investigators in the current issue of *Clinical Science*, should be of interest to your consultant. I have been observing an undoubted case of familial periodic paralysis during the last year. Many years ago the patient discovered for himself that rochelle salt in large doses would effectively abort the paralytic attack. Since the patient has been under my care, we have found that potassium chloride is equally effective.

CLARENCE L. ROBBINS, M.D., New Haven, Conn.

"EXCESSIVE LIBIDO IN MAN"

To the Editor:—THE JOURNAL is looked to throughout the country by physicians as a prominent organ for the dissemination of progress in medical sciences. At times a lack of psychophysiologic evaluation is displayed in the answers concerning clinical problems. In the issue of June 11 is a query entitled "Excessive Libido in Man." The inquiring physician has presented evidence of overactivity of at least three glands of internal secretion in his patient: the thyroid, the pancreas and the gonads. Considerable authority exists to indicate that these glands are influenced by emotional states. Moreover, the man was said to be "nervous," and "bromides" were recommended in the answer. Yet no mention was made of employing psychiatric investigation and treatment in this problem. To state that, other than cauterization, "no remedy has thus far been found to alleviate the condition" is an injustice to those physicians who have labored for years, often with therapeutic success, to demonstrate that a need for excessive sexual activity is a neurotic condition. Most readers of THE JOURNAL (myself among them) look to Queries and Minor Notes for instruction in keeping abreast with the most advanced knowledge in the science of healing. Recently I saw a man aged 29, a psychopath with hypochondriacal reactions, who complained of pain in the genitals. He had been subjected to numerous urologic instrumentations by various doctors until finally orchidectomy was performed! Such practices have no place in a modern medical world and it is a function of THE JOURNAL to exert such guiding influences in maintaining a high standard of medical thinking and treatment as to make therapeutic errors like this rare.

HERMAN SELINSKY, M.D., New York.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, August 6, page 561.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* Examinations will be held in all centers where there is a Class A medical school and five or more candidates who wish to write the examination, Sept. 12-14. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An affiliate of the American Board of Surgery. New York, Oct. 21-22. Applications must be filed sixty days prior to examination. Sec., Dr. Paul M. Wood, 745 Fifth Avenue, New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: St. Louis, Nov. 11-12 *if the number of candidates warrants it.* Applications of Class B candidates should be filed by Sept. 1 and of Class A by Oct. 1. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: Written examinations will be held in various parts of the United States, Oct. 17 and Feb. 20. Application for the October examination must be received before Sept. 15 and for the February examination on or before Jan. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada, Nov. 5. Last date for application is Sept. 20. General examination for all candidates (Groups A and B) will be given in St. Louis, June. Applications must be filed not later than sixty days prior to date of examination. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: New York, Oct. 7, and Washington, D. C., Oct. 8. *All applications should be filed immediately and case reports, in duplicate, must be filed not later than sixty days before the date of examination.* Sec., Dr. John Green, 3720 Washington Blvd., St. Louis, Mo.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Memphis, Tenn., January. Applications for this examination must be filed with the Secretary on or before Oct. 15. Sec., Dr. Fremont A. Chandler, 6 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: Washington, D. C., Oct. 7-8. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Detroit, October 26; Rochester, N. Y., November 13; and Oklahoma City, November 15. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, Dec. 28-30. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Atlantic City, N. J., Sept. 15-18. Sec., Dr. Byrl R. Kirklin, 102-110 Second Ave. S.W., Rochester, Minn.

California March Examination

Dr. Charles B. Pinkham, secretary, California State Board of Medical Examiners, reports the written examination held at Los Angeles, March 8-10, 1938. The examination covered nine subjects and included ninety questions. An average of 75 per cent was required to pass. Fifty-four candidates were examined, fifty of whom passed and four failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1937)	84.2
Stanford University School of Medicine		(1937)	85, 87.3
University of Southern California School of Medicine		(1937)	88.6, 88.7, 89.1
George Washington University School of Medicine		(1937)	85.1
Georgetown University School of Medicine		(1936)	79.1
Loyola University School of Medicine		(1938)	83.1
Northwestern University Medical School		(1934) 75.8,	(1937) 87.2*
Rush Medical College		(1936)	79.9, 86.8, (1937) 83.1, 83.2, 85.3
University of Illinois College of Medicine		(1937)	80.4, 83.9, 84.7,* 85.3
State University of Iowa College of Medicine		(1936)	79.4, (1937) 83.9, 84
University of Louisville Medical Department		(1921)	84.9
University of Louisville School of Medicine		(1935)	85.4
Harvard University Medical School		(1935)	85.6
Tufts College Medical School		(1936) 75.3,	(1937) 78.9, 85.8
University of Minnesota Medical School		(1937) 81.6,*	84.8*
St. Louis University School of Medicine		(1937)	81.6, 81.6, 84, 87.2
Washington University School of Medicine		(1936) 89.4,	(1937) 82.9
Creighton University School of Medicine		(1936)	78.2, (1937) 79.4, 81.1, 82.2
University of Nebraska College of Medicine		(1937)	85.2
Western Reserve University School of Medicine		(1936)	84.1
Jefferson Medical College of Philadelphia		(1936)	85.4
University of Pennsylvania School of Medicine		(1935)	87.9
University of Texas School of Medicine		(1936)	85.2
University of Wisconsin Medical School		(1937)	87.4
McGill University Faculty of Medicine		(1936)	77.6
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg		(1925)	77.6
Julius-Maximilians-Universität Medizinische Fakultät, Würzburg		(1921)	81.8

School	FAILED	Year Grad.	Per Cent
College of Medical Evangelists		(1937)	73.2
St. Louis University School of Medicine		(1937)	73.4
University of Nebraska College of Medicine		(1935)	69.2
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau		(1925)	59.4

Thirty-three physicians were licensed by reciprocity and one physician was licensed by endorsement from April 8 through June 28. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of California Medical School		(1928)	New York
University of Colorado School of Medicine		(1932), (1933), (1936)	Colorado
Chicago College of Medicine and Surgery		(1915)	Illinois
University of Illinois College of Medicine		(1934)	Illinois
Indiana University School of Medicine		(1926)	Indiana
State University of Iowa College of Medicine		(1930) (1935)	Iowa, Minnesota
University of Kansas School of Medicine		(1931) (1935), (1936, 2)	Minnesota, Kansas
Tulane University of Louisiana School of Medicine		(1921)	Louisiana
Tufts College Medical School		(1932)	Mass.
University of Michigan Medical School		(1921)	Michigan
University of Minnesota College of Medicine and Surgery		(1909)	Minnesota
St. Louis University School of Medicine		(1935)	S. Carolina
Washington University School of Medicine		(1928) (1935)	Maryland, New York, (1936) Missouri
Creighton University School of Medicine		(1935)	Nebraska
John A. Creighton Medical College		(1920)	Nebraska
Columbia Univ. College of Physicians and Surgeons		(1928)	New York
Long Island College Hospital		(1914)	New York
Western Reserve University School of Medicine		(1930)	Ohio
University of Oregon Medical School		(1919),	(1935) Oregon
Temple University School of Medicine		(1927)	Ohio
University of Pennsylvania School of Medicine		(1931)	Penna.
University of Pittsburgh School of Medicine		(1931)	Penna.
University of Tennessee College of Medicine		(1917)	Tennessee
University of Wisconsin Medical School		(1932)	Minnesota

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Colorado School of Medicine		(1920)	U. S. Navy

* This applicant has completed the medical course and will receive the M.D. degree on completion of internship.

Montana April Report

Dr. S. A. Cooney, secretary, Montana State Board of Medical Examiners, reports the written examination held at Helena, April 5-6, 1938. The examination covered ten subjects and included fifty questions. An average of 75 per cent was required to pass. Five candidates were examined, all of whom passed. Eleven physicians were licensed by reciprocity and two physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Georgetown University School of Medicine		(1937)	82.4
Rush Medical College		(1936)	82.2, 84.5
University of Illinois College of Medicine		(1937)	88.7
Albany Medical College		(1927)	85.2

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists		(1929)	California
Northwestern University Medical School		(1930)	Michigan
Rush Medical College		(1901)	Nebraska
State University of Iowa College of Medicine		(1937)	Iowa
University of Louisville School of Medicine		(1927), (1930)	Kentucky
University of Minnesota Medical School		(1923), (1936)	Minnesota
St. Louis University School of Medicine		(1936)	Missouri
Creighton University School of Medicine		(1932)	Nebraska
University of Texas School of Medicine		(1928)	Texas

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Harvard University Medical School		(1932)	N. B. M. Ex.
University of Virginia Department of Medicine		(1929)	N. B. M. Ex.

Wyoming Reciprocity and Endorsement Report

Dr. G. M. Anderson, secretary, Wyoming State Board of Medical Examiners, reports five candidates licensed by reciprocity and one candidate licensed by endorsement at the meeting held in Cheyenne, Feb. 7, 1938. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Colorado School of Medicine		(1936, 2)	Colorado
St. Louis University School of Medicine		(1935)	Missouri
University of Nebraska College of Medicine		(1933)	Nebraska
Osteopath*			South Dakota

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Harvard University Medical School		(1927)	N. B. M. Ex.

* Licensed to practice osteopathy and surgery.

Book Notices

A Textbook of Ophthalmology. By Sanford R. Gifford, M.A., M.D., F.A.C.S., Professor of Ophthalmology, Northwestern University Medical School, Chicago. Cloth. Price, $4. Pp. 492, with 259 illustrations. Philadelphia & London: W. B. Saunders Company, 1938.

The author's attempt "to compress within the limited space of a volume which may be used by medical students and general practitioners the essential facts of modern ophthalmology" has been well and thoroughly accomplished. The inclusion of slit lamp microscopy, the measurement of the blood pressure in the retinal vessels, special optical appliances for certain conditions, a list of therapeutic agents employed in ophthalmology, and visual standards adopted by the House of Delegates of the American Medical Association demonstrate the effort to make the text entirely abreast of the time. The colored plates are excellent. If any error has been made in the production of this all inclusive little volume, the voice of derogatory criticism might be directed to the inclusion of so many black and white photographs of fundus conditions and more especially to photographs of diseases of the anterior segment of the eye, which are reproduced too poorly to be of value. Perhaps the author will see fit to replace these by photographs in color or better black and white reproductions in a future edition. The usefulness of the volume is enhanced by thirty pages of index.

Die wissenschaftlichen Grundlagen der Beurteilung von Blutalkoholbefunden. Von Dr. Herbert Elbel, Assistent des Instituts für gerichtliche Medizin der Universität Göttingen. Boards. Price, 7.80 marks. Pp. 106, with 28 illustrations. Leipzig: Georg Thieme, 1937.

This booklet presents in concise form a summary of the literature on the subject of the scientific foundation for the interpretation of the alcohol content of the blood. The thoroughness of the author and his right to an opinion can be appreciated when the 545 references to the literature are considered. Some of the important observations and conclusions of the author are as follows: Alcohol is a factor in about 40 per cent of all accidents involving injury or death. In about 10 per cent of traffic accidents a responsible person had at least 0.2 per cent of alcohol in his blood. The definitely drunken person is less of a menace than one who is less "under the influence" of alcohol. In Germany a driver of a car is under the influence of alcohol when, because of indulgence in alcohol to any degree, he has lost some of his ability to drive his car or to pay proper attention to traffic. It is impossible to diagnose alcoholic intoxication for legal purposes from the clinical symptoms alone, and blood alcohol determinations furnish an important link in diagnosis. A Prussian supreme court further states that even small amounts of alcoholic beverages, which may be insufficient to produce noticeable symptoms, may still be sufficient to affect the safety, agility and distinctness of observation of the driver.

The Widmark method of determining alcohol is considered sufficiently accurate for practical purposes, but an error may be introduced by the presence of ether and acetone. It is interesting to note in this connection that simple tests performed in this country on both blood and urine are not appreciably affected by ether or acetone. The formula of Widmark, by which it is possible to calculate the total amount of alcohol in the body at definite times, is of great medicolegal importance. The ratio of grams of alcohol in the body to alcohol in the blood expressed as parts per thousand is found to average 0.55 for women and 0.68 for men, and the figure that is characteristic for the individual depends on the amount of fat in the body. The author's observations of fasting persons indicates a loss of body alcohol of from 5.4 to 8 Gm. an hour in five men and 4 and 4.3 Gm. in two women.

A discussion of the effect of epinephrine on tolerance for alcohol is particularly interesting, since it suggests the explanation for the sobering effect of fright and excitement; namely, that sudden splanchnic vasodilatation causes a diminished circulation of alcohol through the brain tissue.

A most important conclusion is that the psychic effect of alcohol taken in small doses and associated with low blood alcohol concentrations is so definite that there is no minimal, insignificant or irrelevant degree of consumption of alcohol for the safe handling of a motor vehicle. The author feels that 0.10 per cent of alcohol in the blood is unquestionably associated with definite inferiority, so that the alcohol may be the sole or predisposing cause of an accident. Finally, there is no definite quantitative relationship between blood alcohol concentration and degree of influence; judgment of the degree of culpability also depends on a consideration of the circumstances which brought the individual into contact with the law. This statement is unquestionably correct, but it must be mentioned that several American observers have been able to predict the concentration of alcohol in the blood or urine with remarkable accuracy from careful observation of persons who were arrested for being under the influence of alcohol.

Dream Analysis: A Practical Handbook to Psychoanalysis. By Ella Freeman Sharpe. Cloth. Price, $2.50. Pp. 211. New York: W. W. Norton & Company, Inc., [n. d.].

Since an understanding of psychoanalysis is highly dependent on the analysis of dreams, one should be able to get a great deal of information from a systematized volume on this subject. The author delivered the material included in this volume in lecture form during the years 1934 and 1936 at the London Institute of Psychoanalysis. It is a well organized volume, not particularly technical or deep, but it does require some knowledge of psychoanalysis to get the most out of it. The author begins the volume with a discussion of a dream as a typical and individual psychic product. There is some discussion here of individual dreams, but the symbolism of these dreams is perhaps too lightly touched on, although later in the book this symbolism is developed to a greater extent. Since it is necessary to understand the mechanisms of dream formation, the author devotes the second chapter to this subject and then goes on to a discussion of the value of dreams to the analyst who obtains a clue to the wish fulfilment from the latent content of the dream. Since not all dreams are the same, various types of dreams are taken up, examples being given, such as a dream related by a man experiencing anxiety with regard to women. The next chapter shows in rather brief and sketchy form how a single dream might be analyzed and studied. The relationship of the dream to the content of the psychoanalyst is not explained in full here and, while one can see from this chapter that a great deal can be accomplished with a dream analysis, one does not see the total picture. Dream analysis of course is not a simple technic, so that it is necessary for the author to discuss problems which have come to her in her experience with dream analysis. She also illustrates dreams which occurred during psychic and physical crises. Psychoanalysis, after all, is aimed at readjustment, and the eighth, ninth and tenth chapters deal with readjustment and the results of analysis of persons with regard to their dreams. There is an appendix giving a list of dreams which were recounted in the book and, while a bibliography is listed in the table of contents, in the volume which was sent for review the bibliography was omitted. All in all this book is somewhat useful in rounding out the literature on psychoanalysis. It does not enable the untrained psychiatrist to do much more with dream material than he could before he read the book; but since opinions, particularly those of experienced people, are needed to polish up psychoanalytic thought, there seems to be a definite place for this volume in the library of the psychiatrist who wishes another point of view on psychoanalysis.

Le phénomène de la guérison dans les maladies infectieuses. Par F. d'Hérelle. Paper. Price, 75 francs. Pp. 414, with 19 illustrations. Paris: Masson & Cie, 1938.

The author has already published two monographs on bacteriology. As he indicates, the present work differs in that it is of more general interest than might be inferred from the title, "Phenomenon of Cure in Infectious Diseases." Bacteriophage has made great progress in the course of the last decade. New proofs which are irrefutable have been discovered, and the facts are now generally accepted even by those scientists who formerly disagreed with the principles involved. d'Hérelle devoted more than twenty years of his life to this study, he made many voyages to all parts of the world, and he has followed epizootics in Cochin China, scourges of cholera in the Indian hospitals and the villages of the Punjab, and epidemics of plague in Asia and Africa. He utilized and improved field laboratories in many cases and studied in this way a multitude

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of cases of illness while he lived in the midst of the epidemic. The result of his experience is the advancement of a theory which explains the processes involved in the cure of infectious diseases and the manner in which epidemics are extinguished. In his preface d'Hérelle says "If the theory of cure as advanced and as suggested to me is a true result of my observations, we should be able to reproduce experimentally at will the natural process of cure." The researches which have been made on this subject he relates in the fifth chapter of the work.

This book will interest the bacteriologist and perhaps to a greater degree the biologist in its early chapters, which deal with the actual question of bacteriophage and the problem of bacterial mutations. The portion which deals with the study of infectious diseases and epidemics will present matter of lively interest to the pathologist and the hygienist. For the physician there will be found for each of the diseases actually amenable to this mode of treatment a detailed therapeutic method by *bacteriophagie provoquée*, which represents the specific therapy which will tend to provoke in the case of the diseased individual the actual phenomenon of cure. It is impossible, within the limits of this review, to list the many matters of interest which are taken up in this detailed and remarkable work. Outside the matters which have been indicated thus far and which will be found of great specific interest are the studies of cholera, plague, typhoid and paratyphoid fever, staphylococcic infections and anthrax. As no translation exists, the book will have to be read in the original.

A Critical Investigation of the Blood Groups and Their Medico-Legal Application. By Dawood Matta, M.B., Ch.B., Ph.D., Lecturer of Forensic Medicine, The Faculty of Medicine, University of Egypt, Cairo. The Egyptian University Faculty of Medicine, Publication No. 11. Submitted in thesis form to the University of Glasgow, October, 1936. Paper. Pp. 231, with 4 illustrations. Cairo, 1937.

The book is divided into six sections. The results of the original investigations of the author are thoroughly presented in addition to a brief and critical review of the present day knowledge of blood groups. Matta's investigations extended into many phases of the subject. After a study of the subgroups A_1 and A_2 and of the agglutinins a_1 and a_2 he alines himself with those who hold that the differences between the two are merely quantitative. A titration of 200 specimens of blood group B leads him to the conclusion that as in blood group A there are similar quantitative differences in group B, which he divides into subgroups B_1 and B_2 with the corresponding agglutinins β_1 and β_2. Further evidence is offered by Matta in support of Schiff's concept of the O factor as a blood group specific antigen and not a species antigen. Interesting and thought provoking is Matta's hypothesis of new genotypic formulas which are based on the assumption that the genotype of each person is composed of four genes that may represent each of the agglutinogens A, B or O. Four of each may be present, or any combination of them. He postulates the existence of fifteen subgroups, four within the groups A and B and six within the group AB. No subgroups are present in group O. The agglutinogens A, B and O are all dominant. Two genes out of the four of each parent are transmitted to the child. The subgroups A_1 and A_2, B_1 and B_2 are an expression of the quantity of each agglutinogen in the genotype. A_1 has the formulas AAAA, AAAO or AAOO and A_2 has the formula AOOO. Similar structural formulas are suggested for the subgroups of B. Matta offers rather convincing arguments in favor of his hypothesis. If it stands the test of time, it would offer a satisfactory explanation for those exceptions from the hypothesis of Bernstein in which illegitimacy could not be invoked. The new hypothesis claims to invalidate that part of Bernstein's hypothesis which denies the possibility of an O child of an AB parent; it also claims to invalidate Thomsen's hypothesis of the inheritance of subgroups A_1 and A_2. Matta is fully aware that his hypothesis, being based on a small material (ninety-nine families), needs further confirmation. The monograph includes studies on identification of blood groups in stains made by blood and by seminal fluid, and in saliva, with a valuable emphasis on sources of error. The bibliography is rather brief but well selected. The book is indispensable for those interested in the theory of blood groups and in their practical applications, particularly in medical jurisprudence.

Milestones in Medicine: Laity Lectures of the New York Academy of Medicine. Introduction by James Alexander Miller, M.D., President, New York Academy of Medicine. Cloth. Price, $2. Pp. 276, with illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1938.

This is the second volume of lectures delivered at the New York Academy of Medicine intended to give the layman some idea of background of medicine. As in all symposiums, the various lectures are unequal in their ability to hold the reader's interest. The arrangement of the volume is not such that the average reader would be immediately attracted to its contents. The essays devoted to the history of leprosy, by Newton E. Wayson, and the glands of internal secretion, by Walter Timme, should be, to the nonmedical reader, the most interesting in the volume. One cannot neglect, however, the essays on medicine at sea in the days of sail, by Karl Vogel, and the evolution of the human brain, by Frederick Tilney, which are excellent reading and demonstrate a historical perspective. The chapters on leprosy and medicine at sea are distinctly historical. They deal more with the beginnings of medicine, old customs and beliefs than do the other chapters, while the essay on the evolution of the human brain also contains a great deal that is historical. Timme, in his story of the glands of internal secretion, goes extensively into the stories of research and into the working of the various glands, and occasionally he interjects a sidelight on medical discoveries. There are three other chapters included in this book which are well written by experts, but they do not have the direct bearing on the history of medicine of those previously mentioned. The first chapter, for instance, is by Smith Ely Jelliffe, on the historical background of psychiatry. Ordinarily anything written by Jelliffe should be considered a valuable introduction to any volume in which it is contained. Jelliffe, in his writings and speeches, has always shown a true cultural background, excellent diction and a fascinating way of expressing himself. The present essay shows the first two traits as not particularly interesting—the discourse wanders about, does not cite interesting historical facts in psychiatry and is not up to Jelliffe's standards. The essay on the mechanisms of heredity, by Stockard, is the usual discussion of that subject. Little in the history of medicine is expounded—a few names are mentioned, but not in sufficient fashion to make this other than an essay on a technical medical subject. Dr. Sigerist has included a paper on the history of medical history. In a competent way he points out the various types of historical research which can be found in this field. It is adequate but rather dull. Nevertheless it has a place in the volume because, if one wishes to see the types of study which the other authors who have contributed to the volume have used, they can be interpreted in the light of Sigerist's study.

Handbuch der Erbkrankheiten. Herausgegeben von Dr. med. Arthur Gütt, Leiter der Abteilung Volksgesundheit im Reichs- und Preussischen Ministerium des Innern Präsident des Preussischen Landesgesundheitsrats. Band 1: Der Schwachsinn. Von Dr. med. F. Dubitscher. Paper. Price, 24 marks. Pp. 358, with 45 illustrations. Leipzig: Georg Thieme, 1937.

Because of economic and political changes in Germany there have been few studies following the type of monographic material which has previously been made available for American physicians. Before the war we were deluged with ponderous tomes which, if they made difficult reading, contained encyclopedic information. They were what they pretended to be. The present volume is intended to be a description of feeblemindedness from the standpoint of hereditary diseases with particular reference to the new made tendencies in Germany for sterilization, race purification and the use of medicine for building up the nation as a whole. The volume turns out to be a book which would stress the race purification angle and is a rather heavy study of feeblemindedness from all angles. About one fourth of the book is taken up with the organic brain changes of the feebleminded, particularly those due to bacterial or mechanical traumatism. Exotic diseases are discussed in more detail than their frequency deserves. The last fourth of the book is devoted to a mass of intelligence testing material which has not, apparently, been standardized and is evaluated on an objective basis. It is, however, comprehensive. The discussion of sterilization and the German law regarding the sterilization of the feebleminded is interesting, as it reveals something which American medicine has not heard; namely,

that sterilization has not been entirely enforceable and that while several German race hygienists, foremost among whom is Gütt, who writes the introduction for the present volume, have been trying to do much more sterilizing, the scientific justification of the need for sterilization has not yet been forthcoming, particularly in such cases as mongolian idiocy and those cases which are due to trauma of various sorts. There is a bibliography in this book but it does not compare with bibliographies in earlier handbooks of similar nature. It is incomplete, for much important English literature is omitted although there is a pretense that the English monographs on the subject have been covered. References to individual studies have been made in the text in such a manner that none of the statements can be verified. It scarcely seems necessary to read the present volume to get any new light on the study of feeblemindedness. We in America seem to be far advanced over the Germans in dealing with the backward and the high grade individual. There is, of course, much valuable material which can be culled from this volume, but the effort involved is probably greater than the value to be received. The chapters on the sterilization law and on purification of the race are interesting to those who would like to know what is going on in Germany with regard to these matters.

Alfred Owre: Dentistry's Militant Educator. By Netta W. Wilson. Cloth. Price, $4. Pp. 331, with 8 illustrations. Minneapolis: University of Minnesota Press; London: Oxford University Press, 1937.

This volume is the result of a desire of a number of Dean Owre's friends and former faculty associates in the University of Minnesota to sponsor a tribute to his memory. The book sets forth the record and achievements of Dean Owre in an understanding manner and in a completely sympathetic vein. To this extent the volume accomplishes the purposes for which it was written and consequently will be pleasing to his friends and to those who were in accord with his views on the "level technician plan" of dental education and who agreed with Dean Owre's enthusiasm for the Russian communistic system of health service. In a sympathetic, fictional biography, to be read with the full understanding that the reader is perusing it for inspiration, pastime or amusement, it is of no consequence if the presentation departs somewhat from reality. However, the nature of the sponsorship of this book, the fact that it is published by a university press, and the note of authenticity lent to the work by the personnel mentioned in the section on acknowledgments all give the impression that the contents of the volume may be accepted as strictly factual. The importance of any biographic work must be based on the accuracy and truthfulness of its contents. Only thus can history of value be written. It is to be regretted that Miss Wilson's book contains many gross inaccuracies. It is of relatively small import that she undoubtedly wrote with every intention of recording only an accurate history. Unfortunately the fact remains that the volume, in years to come, may be accepted as a true record of an important phase in the history of the dental profession. Any suspicion of deliberate intent to misstate or mislead may be dismissed because of the gross nature of some of the errors. As a tribute of loyal friends, and as a running history of the life and activities of the dean of two dental schools, the book is interesting and well wrtiten. However, as a factual history of a controversial period in the growth of the dental profession and its system of education, and as a reference work for the future student of the period, the book, through its loose treatment of important events and conditions, is of little value.

Mental Hygiene for Nurses. By Elizabeth Lee Vincent, Ph.D., Psychologist, Merrill-Palmer School, Detroit, Michigan. Cloth. Price, $2. Pp. 263. Philadelphia & London: W. B. Saunders Company, 1938.

This little volume is not a brief textbook in psychiatry for nurses but rather a popular presentation of how to make a mental adjustment, which is particularly necessary for members of the nursing profession. There is little discussion of mental disease in it but rather a superficial treatment of emotional adjustment, in a clearcut, highly simplified, fashion. There is nothing that could not be obtained from one of the more thoroughgoing and better developed books on mental hygiene. However, some chapters view specific types of patients, such as obstetric cases, crippled children, the schizophrenic, unmarried mothers, and others from the point of view of the nurse who wishes to help. There are many types of patient discussed in these chapters but none are given more than a brief paragraph, so that the information which the nurse can use is slight. Between the first chapter and these chapters, which are late in the book, there are general discussions dealing chiefly with methods of building up pleasant and better adjusted personalities for nurses. The information given here is not presented in a manner that is well adapted for the professional person who is able to go through a nurses' training school. It is more for the layman who wishes to overcome timidity and fears and to develop his memory. Background material in the sense of experiment and case records which would enable the professional person to understand both himself and the patient better is largely neglected. There is one chapter that might be commended and that is the chapter on learning. Psychologists, and the author is a psychologist and not a psychiatrist, have stressed learning procedures. Such features of learning as plateaus, laws of learning, are briefly discussed here, and it may be possible that this chapter would aid some nurse in becoming a slightly better student. A well trained mental hygienist or a nurse who is trained in psychiatric nursing under a good staff of teachers would be able to impress her students adequately without this book. The nurse who desires a good mental hygiene background would have to go to one of the more thoroughly developed textbooks in the field to understand the patient and would undoubtedly gain more from experience particularly with psychiatric guidance than she could possibly gain from reading the brief paragraphs in the present volume. One questions whether the author of this book is really acquainted with the problems that confront the nurse in actual practice.

A Biological Approach to the Problem of Abnormal Behavior. By Milton Harrington, M.D., Psychiatrist, Institution for Male Defective Delinquents, Napanoch, N. Y. Cloth. Price, $4. Pp. 459. Lancaster, Pa.: Science Press Printing Company, 1938.

The writer of this volume is known for his critical attitude toward freudian psychology and the present volume is an attempt on his part to establish mechanistic rather than animistic theories as to the function of the human mind. This is the first volume of a projected two volume analysis of the mind based on its physiologic mechanism. The present volume, with the exception of a few introductory chapters, is divided into two major parts, one dealing with psychophysiology and the other with psychopathology. The general physiologic idea behind the work is based on simple stimulus response or elaborated reflex action. There is not much stress on the pavlovian idea in general but rather gross teachings of the animal psychologists are carried over fairly uncritically so that stress is laid on the sensory mechanism aroused by the stimuli and the form of the response. One relatively new point of view which the writer has added but about which he has given no particular structural demonstration is the concept of anticipation, wherein he indicates that the individual can anticipate certain types of needs, results and procedures in order to attain a significant goal. The second part of the volume, dealing with psychopathology, harks back to the early part of the present century. Much disturbance of various physiologic mechanisms previously described is discussed in order to show how pathologic change occurs. He points out that there are five different methods of making an adjustment: accomplishment, withdrawal, modification of thought, modification of posture, disabling of the machine. Psychopathology is a disturbance of one of these types of adjustment. Although there is no question that the mechanistic point of view of psychopathology is coming more and more strongly to the fore, it seems questionable whether the present volume will be satisfactory. First of all there is little actual demonstration either from the literature or by demonstration as to the validity of the theories on which the discussion is based. True, many of the statements made in the volume which support the author's belief are considered axiomatic, but even such a theory as the synoptic basis of memory has had some grave doubts cast on it in recent years. The present volume emphasizes a possible mechanical basis of thought and seems to be regression to the concepts of psychology which were emphasized by the behaviorist. As the author himself points out, these have not, at least in the strictly mechanical sense, satisfied our needs in the diagnosis and therapeutics of mental disease.

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Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Use of Title "Doctor" by Chiropractor Unlawful.—The defendant, a licensed chiropractor, was convicted of violating a provision of the Wisconsin medical practice act restricting the use of the title "doctor" to persons licensed to practice medicine and surgery, osteopathy, or osteopathy and surgery. He appealed to the Supreme Court of Wisconsin.

The section of the medical practice act under which the defendant was convicted provides:

> No person not possessing a license to practice medicine and surgery, osteopathy, or osteopathy and surgery, under section 147.17, shall use or assume the title "doctor" or append to his name the words or letters "doctor," "Dr.," "specialist," "M.D." "D.O." or any other title, letters or designation which represents or may tend to represent him as a doctor in any branch of treating the sick.

It was stipulated that the defendant had advertised and announced himself as "Dr. H. J. Michaels, Chiropractor," or "H. J. Michaels, Doctor of Chiropractic"; that he was a licensed chiropractor under the laws of Wisconsin; that he held a diploma from a chiropractic college declaring him to be a doctor of chiropractic; that he had announced himself as aforesaid on signs about his office and that he had so advertised in pamphlets and newspapers; and that he treated patients by chiropractic adjustments only and fully informed each patient of the method of treatment before giving such adjustments. He contended that under the stipulated facts he had committed no offense under the medical practice act and further that the restriction in that act relating to the use of the title "doctor" was unconstitutional and void. In *Corsten* v. *Industrial Comm.* (Wis.), 207 Wis. 147, 240 N. W. 834, the court had under consideration the right of a chiropractor to receive compensation for treatment pursuant to the provisions of the workmen's compensation act. The court said in that case:

> Under chapter 147 a chiropractor is not a physician, even though he does treat the sick and treat diseases and diagnose. Under that chapter physicians are licensed to practice medicine, section 147.17; while chiropractors receive "a certificate of registration in the basic sciences and a license to practice chiropractic," section 147.23. But "no certificate of registration shall be considered equivalent to a license (to practice medicine)." Section 147.17. And "no person not possessing a license to practice medicine and surgery, osteopathy, or osteopathy and surgery, under section 147.17, shall use or assume the title "doctor" or append to his name the words or letters "doctor," "Dr.," "specialist," "M.D." or "D.O." Section 147.14 (3). Thus these names and letters may be applied only to those who are licensed as physicians to practice medicine and surgery, and conversely those to whom the names and letters may not be applied are not physicians.

Considering the construction thus placed on the restrictions contained in the medical practice act, the court in the present case said, the stipulated facts show that the defendant was clearly guilty of violating those restrictions.

From a consideration of the various acts of the legislature, it was apparent to the court that for more than fifty years the use of the term "doctor" has been restricted in Wisconsin and the right to the use of the term has become associated with those entitled to practice medicine, surgery or, since 1903, osteopathy. The evident purpose of the restriction is to prevent imposition on the general public by the unauthorized use of the term. The defendant claimed that because the degree of doctor of chiropractic had been conferred on him by some school in Indiana, he was entitled to use that term in Wisconsin because it merely represented a statement of fact. When the defendant came to Wisconsin to practice, the court pointed out, he became subject to all the laws of Wisconsin, which certainly could not be modified by a diploma granted by a school in another state. The law providing for the licensing of chiropractors was enacted in 1925 and at the same time the section in the medical practice act relating to the use of the title "doctor" was rewritten and revised. This revision, the court said, was to make it clear that those practicing chiropractic could not hold themselves out as a doctor or append to their names the title of doctor because that would tend to represent them as doctors authorized to practice medicine, surgery or osteopathy. The situation is not aided, the court pointed out, because the defendant explained to his patients the nature of his treatment before administering it. The title does not aid the defendant in the treatment; it merely aids him in securing the confidence of prospective patients and in inducing people to apply for treatment. The repeated attempts by chiropractors to have the section in question amended by legislative action indicated to the court quite conclusively that the meaning of the section was well understood. To the court the section seemed clear and unambiguous and in no way impaired the constitutional rights of the defendant. The judgment of conviction was therefore affirmed.—*State v. Michaels (Wis.), 277 N. W. 157.*

Malpractice: Self-Inflicted Injury While Anesthetized; Res Ipsa Loquitur.—After an appendectomy, performed by the defendant, the patient was removed to his hospital room and left in charge of a special nurse. When the patient regained consciousness, it was discovered that his left eye had been cut. Subsequently the patient lost his eye and sued the defendant, alleging that the injury was due to the defendant's failure to care and protect him properly during the time he was under anesthesia. The trial court directed a verdict for the physician, and the patient appealed to the court of appeals of Tennessee, eastern section.

An ophthalmologist testified that the plaintiff's eye had been cut by a sharp instrument, probably by a finger nail, and that the injury was probably self inflicted. The plaintiff apparently argued that the physician was liable by reason of the doctrine of res ipsa loquitur. That doctrine, said the court, asserts that whenever a thing which produces an injury is shown to have been under the control and management of the defendant, and the occurrence is such as in the ordinary course of events does not happen if due care has been exercised, the injury will be deemed to be due to the defendant's negligence, in the absence of any explanation by the defendant tending to show that the injury was not due to his want of care. While the doctrine has no application to the ordinary malpractice case, it should be applied, the court said, when a sound and unaffected member of the body, not the subject of the physician's diagnosis or treatment, is injured or destroyed while the patient is unconscious and under the immediate and exclusive control of the physician. The physician argued, apparently, that the doctrine should not be here applied because the injury was not shown to have resulted from the use of an "instrumentality" under his management and control. But, said the court, a human body, freed of the control of a conscious and rational mind, becomes an "instrumentality" potentially dangerous.

The patient contended that, within the meaning of the doctrine, he remained under the control of the defendant from the administration of the anesthetic until he regained consciousness the following morning. While the patient, said the court, remained under the control of the physician so long as he was in the operating room, after he was removed to his private room and after the physician left that room he was under the control of the graduate nurse. It was not shown, the court said, that the nursing of the patient, following the operation, was any part of the undertaking of the physician. During the performance of an operation a hospital nurse, although not in the regular employ of the operating physician, is under his special supervision and control and during that time the relation of master and servant, or principal and agent, exists and the physician is responsible for the negligence of the nurse. But, in the absence of special contract, the physician is not responsible for a negligent act of a nurse in the after-treatment of the patient following the operation unless it appears that the physician assumes to continue his control and direction of the nurse following the operation. The burden of proof rested on the patient to establish as a prerequisite to the application of the doctrine of res ipsa loquitur that the injury occurred while the plaintiff was under the control of the defendant. This the patient failed to do.

The physician did not assume responsibility for the safety of the patient following the operation because of a remark he made to members of the patient's family, after the patient had been taken from the operating room to his private room and on

being informed that the patient was violent under ether, to the effect that "we" will take care of him. The physician merely intended to reassure the family that the patient would be properly cared for at the hospital. In leaving his patient in charge of the graduate nurse the physician was guilty of no negligence. The evidence showed that graduate nurses are especially trained to care for patients following operations of this kind; that most patients are violent to some degree while under anesthesia; that it is considered safe practice to leave patients in the care of a graduate nurse, following the administration of an anesthetic; and that it was not customary for physicians to remain with their patients until they recover consciousness.

The court of appeals concluded, therefore, that the trial court was correct in directing a verdict for the physician.—*Meadows v. Patterson (Tenn.), 109 S. W. (2d) 417.*

Malpractice: Radium Treatment of Facial Blemish Allegedly Resulting in Burns.—In 1922 the plaintiff, when 4 years old, developed on her forehead a pinkish area which was diagnosed by a physician as a birthmark. She was taken to the defendant physician, a dermatologist, who attempted to remove the blemish with radium. Following the second treatment, which according to the plaintiff's evidence occurred two weeks after the first treatment, the part of the plaintiff's forehead to which the radium had been applied assumed a burned or seared appearance, with a cracking and discoloration of the skin. The condition grew progressively worse and seriously affected the skin and the underlying bone structure in a manner plainly discernible. Attributing the resultant condition to the defendant's negligence in applying the radium treatment, the plaintiff sued. At the close of the plaintiff's case the trial court, on motion of counsel for the defendant, withdrew the case from the jury and gave judgment for the defendant. The court of appeals, Ohio, affirmed that judgment and the plaintiff appealed to the Supreme Court of Ohio.

A motion for a directed verdict, said the court, accepts as true every fact offered in evidence by the plaintiff with the reasonable inferences deducible therefrom. The defendant, called for cross examination, admitted it would be "inadvisable" to give treatments of the kind to which the plaintiff had been subjected oftener than three weeks apart and asserted that in the plaintiff's case three months should have intervened between treatments. He maintained, however, that a period of three months did actually transpire between the first and second treatment, and that the affliction concerning which the plaintiff complained was not due to a burn but to a disease known as scleroderma. On the other hand, the plaintiff's father and grandmother testified positively that a space of but two weeks elapsed between the first and the second radium treatment. Two dermatologists took the stand as plaintiff's witnesses but on cross examination they testified that their present opinion was that the plaintiff's blemished forehead was the result of scleroderma and not of a burn. Another medical witness for the plaintiff testified that in his opinion the condition of the forehead was due to a radium burn, "the second treatment being given too near the first treatment; there was evidently an accumulative condition in her case after the first treatment of radium, and the burn resulted." This witness could discover no indication of scleroderma. At the instance of the trial judge, and by agreement of counsel, a professor of pathology in the medical school of Western Reserve University became a witness. "In my opinion," said this witness, "that is not a radium burn, and is more like a scleroderma than any other disease I know." On examination by counsel for the plaintiff, this witness admitted there was some evidence of a radium burn, and that a previous written report in the matter, prepared by his assistant, contained a diagnosis of cutaneous cicatrix or skin scar. Viewing the plaintiff's evidence in the light most favorable to her claim, she presented, in the opinion of the court, a chain of circumstances and events from which the ultimate facts of negligence and proximate cause could be reasonably inferred. The plaintiff having thus made a prima facie case, it was reversible error for the trial court to take the case from the jury and render judgment for the defendant.

The trial court did not err in declining to permit counsel for the plaintiff to interrogate the two dermatologists, who testified for the plaintiff, regarding the opinion held by them as to the cause of the plaintiff's affected forehead at a time prior to their advent as witnesses at the trial. These physicians, the court said, took the stand as plaintiff's witnesses, and the record suggests that counsel for the plaintiff had been advised by them before they were called that their ultimate opinion was unfavorable to the plaintiff's contention. Medical experts, said the court, should state the opinions they hold at the time they testify, rather than the opinions held at some previous time.

The judgments of the trial court and of the intermediate appellate court were reversed and the cause remanded to the trial court for further proceedings.—*Hubach v. Cole (Ohio), 12 N. E. (2d) 283.*

Libel: Imputation of Tuberculosis Not Actionable Per Se.—A newspaper item, in discussing the situation at a state tuberculosis sanatorium, contained a statement that "there are a number of persons employed there, including part-time doctors, who are so-called arrested cases of tuberculosis." There were four part-time physicians employed at the sanatorium and one of them, the plaintiff in this case, instituted an action for libel against the newspaper. The trial court sustained a demurrer interposed by the defendant and the plaintiff appealed to the Supreme Court of Wisconsin.

The newspaper item, said the Supreme Court, did not refer specifically to the plaintiff by name nor did it state that all of the part-time physicians had tuberculosis. The plaintiff, therefore, was not, in the opinion of the court, sufficiently identified to entitle him to sue. Furthermore, to charge that a person has an arrested case of tuberculosis is not actionable per se; special damages must be alleged and proved. The complaint in this case alleged no special damages and for that reason the trial court committed no error in sustaining the demurrer.—*Kassowitz v. Sentinel Co. (Wis.) 277 N. W. 177.*

Society Proceedings

COMING MEETINGS

American Association for the Study of Goiter, Washington, D. C., Sept. 12-14. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, White Sulphur Springs, W. Va., Sept. 22-24. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.

American Association of Railway Surgeons, Chicago, Sept. 19-21. Dr. Daniel B. Moss, 547 W. Jackson Blvd., Chicago, Secretary.

American Congress of Physical Therapy, Chicago, Sept. 12-15. Dr. Richard Kovacs, 1100 Park Ave., New York, Secretary.

American Hospital Association, Dallas, Texas., Sept. 26-30. Dr. Bert W. Caldwell, 18 East Division St., Chicago, Executive Secretary.

American Roentgen Ray Society, Atlantic City, N. J., Sept. 20-23. Dr. Carleton B. Peirce, University Hospital, Ann Arbor, Mich., Secretary.

Clinical Orthopedic Society, Nashville, Tenn., and Birmingham, Ala., Oct. 7-8. Dr. H. Earle Conwell, 214 Medical Arts Bldg., Birmingham, Ala., Secretary.

Colorado State Medical Society, Estes Park, Sept. 7-10. Mr. Harvey T. Sethman, 537 Republic Bldg., Denver, Executive Secretary.

Idaho State Medical Association, Sun Valley, Sept. 6-10. Dr. Harold W. Stone, 105 North Eighth St., Boise, Secretary.

Indiana State Medical Association, Indianapolis, Oct. 4-6. Mr. Thomas A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.

Kentucky State Medical Association, Louisville, Oct. 3-6. Dr. Arthur T. McCormack, 620 South Third St., Louisville, Secretary.

Michigan State Medical Society, Detroit, Sept. 19-22. Dr. L. Fernald Foster, 311 Center Ave., Bay City, Secretary.

Mississippi Valley Medical Society, Hannibal, Mo., Sept. 28-30. Dr. Harold Swanberg, 510 Main St., Quincy, Ill., Secretary.

National Medical Association, Hampton, Va., Aug. 15-19. Dr. John T. Givens, 1108 Church St., Norfolk, Va., General Secretary.

Nevada State Medical Association, Reno, Sept. 23-24. Dr. Horace J. Brown, 120 N. Virginia St., Reno, Secretary.

Northern Minnesota Medical Association, Crookston, Aug. 29-30. Dr. J. F. Norman, Crookston, Secretary.

Oregon State Medical Society, Timberline Lodge, Aug. 24-27. Dr. Morris L. Bridgeman, 1020 S.W. Taylor St., Portland, Secretary.

Pennsylvania Medical Society of the State of, Scranton, Oct. 3-6. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh, Secretary.

Society of American Bacteriologists, San Francisco, Aug. 30-Sept. 1. Dr. I. L. Baldwin, College of Agriculture, University of Wisconsin, Madison, Wis., Secretary.

Utah State Medical Association, Ogden, Sept. 1-3. Dr. D. G. Edmunds, 610 McIntyre Bldg., Salt Lake City, Secretary.

Vermont State Medical Society, Burlington, Oct. 6-7. Dr. B. F. Cook, 154 Bellevue Ave., Rutland, Secretary.

Virginia, Medical Society of, Danville, Oct. 4-6. Miss Agnes V. Edwards, 1200 East Clay St., Richmond, Secretary.

Washington State Medical Association, Bellingham, Aug. 29-31. Dr. V. W. Spickard, 1303 Fourth Ave., Seattle, Secretary.

Wisconsin, State Medical Society of, Milwaukee, Sept. 13-16. Mr. J. G. Crownhart, 119 East Washington Ave., Madison, Secretary.

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Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1928 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

22: 401-536 (July) 1938

*Infectiousness of Semen of Patients with Late Syphilis: Experimental Study. J. E. Kemp, Chicago.—p. 401.

Serologic Reactions and Immunity in Relation to Infection and Treatment of Syphilis. J. A. Kolmer, Philadelphia.—p. 426.

*Appraisal of Laughlen Serologic Test for Syphilis. G. S. Usher, Baltimore.—p. 452.

Method for Quantitation of Inoculums in Experimental Syphilis. H. J. Morgan and G. P. Vryonis, Nashville, Tenn.—p. 462.

Further Experiences with Mapharsen; Its Use in Latent Syphilis. G. D. Astrachan and F. Wise, New York.—p. 470.

Experimental Contribution to Study of Antisyphilitic Hyperthermy Produced by Physical Agents. A. Bessemans, Ghent, Belgium.—p. 478.

Role of Biopsy in Diagnosis of Venereal Diseases: Histologic Differentiation of Venereal Granuloma and Lymphogranuloma and Chancroid. E. R. Pund, R. B. Greenblatt and Georgia Brawner Huie, Augusta, Ga.—p. 495.

Spirochetes in the Brain in General Paresis in Jamaica. G. M. Saunders, Kingston, Jamaica, British West Indies.—p. 503.

Syphilis in Dependent Mothers. Helen Harrington and L. J. Matschat, New York.—p. 513.

Semen of Patients with Late Syphilis.—In an experimental study of the infectiousness of the semen in late syphilis, Kemp inoculated rabbits intratesticularly with fifteen specimens of semen from fifteen different persons, all with syphilis of a duration of four years or more. In an attempt to evaluate the experimental methods of Kertesz, five of the fifteen specimens of semen were collected aseptically and portions of each were inoculated into the posterior chamber of one eye of each of the two rabbits which received the intratesticular inoculation. The control groups comprised rabbits inoculated in the posterior chamber with the semen collected aseptically from four nonsyphilitic persons and rabbits inoculated in the same manner with material collected under cleanly but not aseptic conditions from four nonsyphilitic persons. Except that the ophthalmia acquired by the animals inoculated with the semen that was not collected aseptically was somewhat more severe, there was little difference in the appearance of the eyes of the animals inoculated with the semen of syphilitic and nonsyphilitic individuals. The contentions of Kertesz that inoculation of the posterior chamber of the eye is to be preferred to other methods of inoculation were not confirmed. A review of the available literature shows that, including the present fifteen cases, the semen of 144 persons with syphilis has been investigated for the presence of spirochetes. Sixty-seven persons had early syphilis (syphilis of four years or less) and fifty-two had syphilis longer than four years. Spirochetes were demonstrated in the semen of thirteen of the former group. The majority of this group had untreated florid secondary syphilis or infectious mucocutaneous relapses. In contrast, in only one instance were spirochetes demonstrated in the semen of the fifty-two persons with late syphilis. Because of insufficient data, it was not possible to determine accurately the influence of treatment on the presence of the spirochetes in the semen of the fifty-two patients with late syphilis. Of the fifteen patients in the author's group about whom this information was available, approximately one half were untreated. The semen of all fifteen was noninfectious for rabbits.

The Laughlen Test for Syphilis.—Usher states that the Laughlen test gave an excessive number of positive reactions on 181 presumably nonsyphilitic persons. When the sensitivity of the reagent was reduced sufficiently to eliminate these falsely positive reactions, it failed in a significant number of instances to detect reagin in serums which were positive to the Eagle flocculation reaction. It is concluded that the Laughlen serologic test for syphilis may be of value in a reliable laboratory as a spot or exclusion test but is not a satisfactory test to be used by a "medical practitioner or technician without special training" (as claimed by Laughlen).

Annals of Surgery, Philadelphia

108: 1-160 (July) 1938

Insensible Loss in Surgical Patients. W. W. Fuge, Buffalo, and B. M. Hogg, New York.—p. 1.

Excision of Axillary Vein in Radical Operation for Carcinoma of the Breast. H. Neuhof, New York.—p. 15.

Postoperative Roentgenotherapy in Cancer of the Breast. W. C. White, New York.—p. 21.

Peptic Ulcer. A. J. Present, La Jolla, Calif.—p. 32.

*Changing Methods in Surgical Treatment of Peptic Ulcer: Study of Cases Operated on at the Roosevelt Hospital, New York. C. W. Cutler Jr., New York.—p. 68.

Gastro-Enterostomy. C. Eggers, New York.—p. 84.

Postoperative Jejunal Ulcer: Study of Twenty-Three Cases Operated on at the Presbyterian Hospital, New York. A. Grossman, Chicago.—p. 105.

Fusion in Charcot's Disease of the Knee: New Technic for Arthrodesis. R. Soto-Hall, San Francisco.—p. 124.

Intramedullary Pressure, with Particular Reference to Massive Diaphysial Bone Necrosis: Experimental Observations. R. M. Larsen, Nashville, Tenn.—p. 127.

*Effect of Direct Application of Cod Liver Oil on Healing of Ulcers of the Feet in Patients with Diabetes Mellitus. H. Brandaleone, New York.—p. 141.

Treatment of Peptic Ulcer.—Cutler points out that since Peck's report (medical treatment of peptic ulcer), that is from 1924 through 1937, *262* patients have been operated on at the Roosevelt Hospital (*269* operations) for chronic ulcers of the stomach and duodenum, exclusive of operations for acute perforations of primary ulcers. It is of interest to observe that year by year the number of operations performed for these conditions has gradually diminished, and this without a significant diminution of the number of cases admitted. In 1926 there were forty-six such operations, in 1936 but twelve. This change has been due primarily to the increasing recognition of the fact that careful medical management is capable of relieving or controlling a considerable number of these cases. Surgery is indicated only in cases in which the medical regimen has failed or in which complications have resulted. All cases of chronic peptic ulcer are now considered as medical problems primarily and the patients are admitted directly to the medical wards. Not only is no patient now operated on at the Roosevelt Hospital for chronic peptic ulcer without having had a thorough, controlled and efficient course of medical management, but each patient for whom operation is proposed must be passed on by a "court" consisting of physician, surgeon, gastro-enterologist and roentgenologist. The type of operation to be employed in each case is determined by certain guiding principles: 1. The operation must be of such a nature that the particular patient can tolerate and survive it. 2. Not only should it aim at alleviation of symptoms, but it should give freedom from likelihood of recurrence or of complications, both early and late. 3. The ideal procedure having been determined, it should be abandoned or modified if the condition found at operation warrants. The pursuit of the foregoing policies and practices is encouraged by the early results in the present group of cases. The fourteen year period covered by the report shows a mortality in Polya and Billroth II resections, for all types of primary peptic ulcer, of 9.3 per cent. This compares favorably with the 8.5 per cent mortality of gastro-enterostomies during the same period, when one considers the 16 per cent of recorded late poor results with gastro-enterostomy, as against the 3 per cent of poor results with resection. These figures do not take into account the cases of secondary complications.

Cod Liver Oil and Ulcers of Feet.—Brandaleone observed two groups of diabetic patients; one a control group of eleven patients who received routine foot care (article on procedure abstracted in THE JOURNAL Feb. 27, 1937, page 760) and group 2, consisting of twenty-one patients who had received

routine foot care for a period of from one to 136 weeks when cod liver oil was applied locally to the lesions. These patients may be considered as their own controls during the period prior to the use of cod liver oil. Of the twenty-one lesions in the control group of eleven patients three were unhealed, nine improved, one healed completely and eight recurred after from thirteen to thirty-two weeks of treatment. Of the twenty-one patients treated with cod liver oil, only one failed to show complete healing. This patient had coronary sclerosis and generalized arteriosclerosis and evidenced mild congestive cardiac failure. Continued cod liver oil therapy in the hospital failed to heal the ulcer. The lesion of another patient did not heal completely after forty-four weeks of cod liver oil therapy in the clinic, but healing resulted in four weeks when bed rest was instituted. The average time in weeks required for complete healing of the ulcers, in the twenty cases in which healing occurred, was 10.1 weeks. The average duration in weeks of the same ulcers, prior to cod liver oil therapy and during a period of routine foot care, was twenty-four weeks. These patients during the entire period of observation attended the clinic at least twice a week and, during the treatment with cod liver oil, once a week. In four cases the ulcers could really be classified as chronic, having existed for more than seventy-eight weeks. The healing that occurred resulted from a rapid increase in epithelial tissue. As this took place the tissue assumed a healthier appearance and the uneven margins smoothed out.

Archives of Otolaryngology, Chicago

27: 661-798 (June) 1938

Treatment of Pharyngeal Cancer. H. E. Martin, New York.—p. 661.

*Intracranial Complications of Infections of Nasal Cavities and Accessory Sinuses: Survey of Lesions Observed in Series of 15,000 Autopsies. C. B. Courville and L. K. Rosenvold, Los Angeles.—p. 692.

Thrombopenic Purpura as Complication: Association with Acute Mastoiditis, Lateral Sinus Thrombosis, Streptococcus Viridans Bacteremia and Multiple Metastatic Abscesses. B. Welt and J. Kasnetz, Brooklyn.—p. 732.

Congenital Arteriovenous Fistula of Middle Ear and External Auditory Canal. B. T. Horton and B. E. Hempstead, Rochester, Minn.—p. 736.

Meningitis of Otitic Origin: Report of Two Cases. O. R. Kline, Camden, N. J.—p. 739.

Rhinosporidium Seeberi: Etiologic Agent in Production of Nasal Polyps. J. G. Pasternack, New Orleans, and C. S. Alexander, Houston, Texas.—p. 746.

Schwannoma. A. M. Gnassi and M. Borrone, Jersey City, N. J.—p. 766.

Intracranial Complications of Nasal and Sinus Infections.—Courville and Rosenvold reviewed the protocols of 15,000 consecutive necropsies performed at the Los Angeles County Hospital over approximately seventeen years. In only forty-three cases was intracranial infection due primarily to paranasal sinusitis. In four other cases the infection obviously came from the region of the nares. There were seven cases in which a primary malignant tumor invaded the skull, but in only three of these was the erosion followed by a suppurative lesion within the skull. In one case syphilitic erosion of the base of the skull provided an opening for infection to enter the intracranial space from the nasal sinuses. Thus, in a total of fifty-one cases an inflammatory lesion of the intracranial space was actually due to disease in the nasal cavities or the accessory nasal sinuses. In eleven other cases infection in both the middle ear and the accessory nasal sinuses made it difficult or at times impossible to determine which focus was responsible for the intracranial lesion. For a study of meningitis following trauma a survey was made of the protocols of 1,698 additional necropsies, and sixty-four instances of septic meningitis were discovered. In twenty-five cases the fracture line involved the ethmoid, the sphenoid or the frontal sinus and in eight other cases both the anterior and the middle fossa were the seats of fracture lines, so the source of infection might have been either the accessory nasal sinuses or the middle ear. In general, an acute infectious lesion is more apt to result in intracranial complications than is a chronic one, a situation which differs from that present in otitis media and in mastoiditis, in which chronic disease is more prone to extend intracranially. Even to a greater extent than with otitis media, such rhinogenic complications are apparently much more common in males than in females (4:1).

Archives of Physical Therapy, Chicago

19: 321-384 (June) 1938

Fango Treatment of Arthritis. E. Vrtiak, S. Benson, D. Kobak and A. J. Carlson, Chicago.—p. 325.

Vascular Instability in Development of Endocarditis. A. J. Nedzel, Chicago.—p. 335.

Limitations of Alternate Suction and Pressure in Peripheral Obliterative Vascular Diseases. J. R. Veal, New Orleans.—p. 340.

Exact Dosimetry in Short Wave Therapy. P. Wenk, Erlangen, Germany; translated and modified by A. Bachem, Chicago.—p. 350.

Treatment of Male Genitals by Short Wave Diathermy: Report on New Technic with Special Electrodes. D. Derow, New York.—p. 353.

Radium Therapy in Benign Conditions of Nose and Throat. J. C. Seal, New York.—p. 360.

Endocrinology, Los Angeles

22: 1-120 (July) 1938

Inhibition of Uterine Bleeding with Estradiol and Progesterone and Associated Endometrial Modifications. F. L. Hisaw and R. O. Greep, Cambridge, Mass.—p. 1.

Nutritional Requirements of Pregnant and Lactating Rats Studied by Self-Selection Method. C. P. Richter and B. Barelare Jr., Baltimore.—p. 15.

Six Hour Assay for Quantitative Determination of Estrogen. E. B. Astwood, Cambridge, Mass.—p. 25.

*The Menopause: Consideration of Symptoms, Etiology and Treatment by Means of Estrogens. H. Wiesbader and R. Kurzrok, New York.—p. 32.

Studies Relating to Time of Human Ovulation: III. During Lactation. P. M. Lass, Jane Smelser and R. Kurzrok, New York.—p. 39.

Relative Effectiveness of Testosterone Propionate and Dihydro-Androsterone Benzoate in Chick as Indicated by Comb Growth. W. R. Breneman, Bloomington, Ind.—p. 44.

Precocious Masculine Behavior Following Administration of Synthetic Male Hormone Substance. J. B. Hamilton, New Haven, Conn.—p. 53.

Nasogenital Relationship: Induction of Pseudopregnancy in Rat by Nasal Treatment. M. C. Shelesnyak and S. Rosen, New York.—p. 58.

Study of Ratio of Amount of Theelin Producing Uterine and Vaginal Estrus. A. J. Szarka and G. Kurtz, Budapest, Hungary.—p. 64.

*Skin Tests for Pregnancy. P. M. Lass, Erna S. Enderle and R. Kurzrok, New York.—p. 71.

*Effect of Anterior Pituitary-like Hormone on Spermatogenesis in the Human. H. S. Rubinstein, Baltimore.—p. 75.

Studies on Motility of Human Uterus in Vivo: Functional Myometrial Cycle. L. Wilson and R. Kurzrok, New York.—p. 79.

Studies on Pituitary Weight of Rats Inoculated with Transmissible Tumor. J. M. Twort and M. Lasnitzki, Manchester, England.—p. 87.

Clinical Hormone and Histologic Conditions in Case of Hermaphroditism (Female Exterior). J. Charvát, E. Kodíček and O. Schubert, Prague, Czechoslovakia.—p. 91.

The Menopause.—Wiesbader and Kurzrok treated the menopause symptoms of 200 patients with purified or crystalline estrogen. The patients have been observed for not less than six months and, on the average, not more than three years. The etiologic factor in the causation of the menopause was spontaneous menopause in 160, surgical menopause in thirty-four and radiation menopause in six. Some measure of relief was obtained in all subjects. The best results were obtained in the patients who had stopped menstruating completely. Patients who were menstruating regularly did not respond as well. Some other unknown factor could have been responsible for the production of their symptoms and the therapy did not replace this last (or disturbed) factor. The patients who were still menstruating reduced their flushes by two thirds. On the contrary, a patient with complete menopause frequently reduced her flushes from forty to fifty a day to from one to two. Not only did the improvement manifest itself in the bettering of isolated symptoms, but there was often a marked improvement in the well being of the patient. Irritability, sleeplessness and fatigue subsided rapidly. The arthritic changes arising at the menopause (except those due to focal infection) respond to therapy, but the response is not the same in all patients. Possibly the patients who responded only moderately to therapy suffered from a type of arthritis that was both infectious and metabolic in character. In general it required the persistent injection of large doses of estrogens (50,000 international units) twice a week, over a period of two or more months, to obtain a good result in the responsive type of patients. Premenstrual depression was relieved in all except one patient. Patients suffering from migrainous headache were definitely relieved. Uterine bleeding reappeared in those patients in whom menstruation had previously ceased. Examination of endometrial biopsies obtained at the time of bleeding showed a proliferative type of endometrium. The total dosage of estrogen which produced the bleeding varied greatly, ranging from 250,000 to 2,000,000 inter-

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national units. All bleeding ceased when the injections were discontinued or the dose decreased. The menopausal symptoms were entirely relieved in some patients during such bleeding and made distinctly worse in others. Treatment should not begin before definite distressing menopausal symptoms appear. Similarly, treatment is continued until there is a tendency for the distressing symptoms to disappear. This varies according to the patient; it may range from six months to three or more years. If definite symptoms reappear after treatment has been discontinued, a short course of therapy is again instituted.

Skin Tests for Pregnancy.—The importance of the intercutaneous injection of anterior pituitary extract in clinical medicine led Lass and his associates to investigate its possibilities. The gonadotropic substance used was a flocculent powder obtained by alcohol precipitation of the urine of human pregnancy. Immediately before use the powder is dissolved in distilled water containing a small amount of merthiolate. When 1 cc. of the solution is assayed it is equivalent to 100 rat units. One-tenth cc. was injected intradermally. The similar amount of solvent (merthiolated distilled water) was injected as a control. A positive reaction was based on the presence of a central wheal (often showing pseudopods) surrounded by an area of erythema. To obtain some idea of the accuracy of this test, 108 pregnant patients were injected with the gonadotropic substance and the control solutions. Eight patients gave a positive reaction, 100 patients a negative reaction. Twenty-five normal women (nonpregnant) were then tested. Nine patients gave a positive reaction and sixteen patients gave a negative reaction. A third group of patients, comprising 100 nonpregnant women, was then tested. All these patients were allergic to one or many substances. Forty-seven patients gave a positive reaction and fifty-three patients gave a negative reaction. Twenty-one allergic men were tested; sixteen gave a positive reaction and five gave a negative reaction. In view of the fact that Gruskin puts great stress on the technic of the intradermal injection of an antigen prepared from human placental tissue, seventy-three pregnant patients were injected with the antigen and with a suitable control (amniotic fluid). Thirty-five patients gave a positive reaction, twenty-six patients gave a doubtful reaction and twelve patients gave a negative reaction. According to the test, only 48 per cent of the patients were definitely pregnant. Actually all were pregnant. A second group of fifteen normal nonpregnant patients was then tested. Three patients gave a positive reaction and twelve patients gave a negative reaction. The error was 20 per cent. Of twenty males tested, five gave a positive reaction and fifteen gave a negative reaction. Hence neither test is reliable or of any value in clinical medicine.

Effect of Gonadotropic Substance on Spermatogenesis.—Studies bearing on the effect of spermatogenesis in man were carried out by Rubinstein on six healthy adult males. Because the count was found to increase gradually through a period of six or seven days following an ejaculation, control counts were listed for one and six or seven day specimens. Injections of gonadotropic substance in dosage approximating 1,000 rat units weekly were administered intramuscularly three times a week for a period varying from five to nine weeks. Sperm specimens collected by condom or through masturbation were studied for volume, number per cubic centimeter, total number, motility, viability and morphology. Total counts were compared with controls. Morphology, viability and motility showed no changes from the normal. It was found that in all cases the total count was increased above normal after periods of treatment varying from four to seven weeks, remaining high in all cases but one. After the injection of gonadotropic substance was discontinued the counts continued high in all cases (including the patient in whom a drop had occurred during the treatment) for periods ranging from two to five weeks, after which they returned to normal levels.

Indiana State Medical Assn. Journal, Indianapolis

31: 327-378 (July) 1938

Comments on Traffic Hazards. M. N. Hadley, Indianapolis.—p. 327.
Highway Accidents. J. V. Reed, Indianapolis.—p. 328.
Head Injuries. F. B. Ramsey, Indianapolis.—p. 332.
Fractures: Recent Advances in Treatment with Nonelectrolytic Metal Appliances. C. S. Venable and W. G. Stuck, San Antonio, Texas.—p. 335.
Gunshot Wounds of the Abdomen. F. W. Taylor, Indianapolis.—p. 342.

Johns Hopkins Hospital Bulletin, Baltimore

62: 565-642 (June) 1938

Observations Concerning Toxicity, Absorption and Therapeutic Effect of Sulfanilamide and Certain Related Organic Sulfur-Containing Compounds in Experimental Infections in Mice. W. H. Feinstone, Eleanor A. Bliss, E. Ott and P. H. Long, Baltimore.—p. 565.
*Occurrence of Pharyngeal Infections in Exophthalmic Goiter. J. T. King, Baltimore.—p. 593.
Researches on Tetanus: VIII. At What Point in Course of Tetanus Does Antitetanic Serum Fail to Save Life? J. J. Abel and W. Chalian, Baltimore.—p. 610.

Pharyngeal Infections in Exophthalmic Goiter.—King found that the incidence of tonsillitis in exophthalmic goiter is higher than it is in a mixed group of patients with tuberculosis, cancer and syphilis. The incidence is higher in each department of the comparison and higher than in any one of the three groups of "control" cases. The incidence of tonsillitis in exophthalmic goiter is essentially the same as in rheumatic fever. The importance of such infections must be determined for exophthalmic goiter as has been done for rheumatic fever. At present there is danger that the once popular infectious theory of exophthalmic goiter may be forgotten. From experience with rheumatic fever it has been learned that no significance can be attributed to the fact that tonsillectomy does not necessarily cure a condition with which tonsillitis is intimately related in an etiologic role. The author has never seen tonsillectomy cure exophthalmic goiter, but he believes that this procedure helps to prevent recurrences. The infectious theory has been obscured by the concept that infection in general may cause enlargement of the thyroid and that the thyroid may in this manner aid in combating infection. This may be true but there is no evidence that infections other than pharyngeal and "rheumatic" are concerned in the etiology of exophthalmic goiter. There is sufficient evidence, however, to warrant serious consideration. Infections of the upper part of the respiratory tract and lymphoid hyperplasia which precede or follow the establishment of exophthalmic goiter are best explained as a part of the disease itself, establishing with cervical adenitis and thyroid hyperplasia a syndrome of infectious origin known as exophthalmic goiter.

Journal of Bacteriology, Baltimore

35: 561-674 (June) 1938. Partial Index

*Bacillus Parapertussis: Species Resembling Both Bacillus Pertussis and Bacillus Bronchisepticus But Identical with Neither. Grace Eldering and Pearl Kendrick, Grand Rapids, Mich.—p. 561.
Quantitative Method of Determining Lethal Effect of Ultraviolet Light on Bacteria Suspended in Air. D. G. Sharp, Durham, N. C.—p. 589.
Effect of Salts on Germicidal Action of Phenol and Sec-Amyltricresol. H. W. Lundy, Cambridge, Mass.—p. 633.

Bacillus Parapertussis.—In connection with a report in 1934 on the results of cough plate examinations for Bacillus pertussis, Eldering and Kendrick noted that all of 136 strains isolated from patients with whooping cough were similar serologically and corresponded with Leslie and Gardner's phase 1 cultures (1931). Since then, up to June 1937 the total number of phase 1 cultures has increased to 1,498. During that period the authors isolated from seven patients with whooping cough ten cultures which resemble Bacillus pertussis in certain respects but do not conform with all the criteria ascribed to phase 1 cultures. Strains similar to these ten were not recovered from more than 1,500 cough plates from patients with infections of the upper part of the respiratory tract other than whooping cough. On the original cough plates from which these organisms were recovered the colonies were typical of Bacillus pertussis after an incubation period of forty-eight hours. Morphologic and staining reactions appeared typical of Bacillus pertussis, and agglutination tests were positive with Bacillus pertussis antiserum in low dilution. The plates were reported positive for Bacillus pertussis to the attending physicians. However, after longer incubation the colonies on these cough plates were observed to be unusually large and, unlike Bacillus pertussis, were found to grow profusely on plain infusion agar and in broth. Recognizing a possible relationship to Bacillus bronchisepticus, the authors tested the cultures against a Bacillus bronchisepticus antiserum and found that the organisms were agglutinated to high titer. Unlike Bacillus bronchisepticus, however, they were nonmotile. While closely related antigeni-

cally to both Bacillus pertussis and Bacillus bronchisepticus, these cultures are identical with neither. Their significance in connection with whooping cough is not yet clear. For convenience of reference, the name Bacillus parapertussis is used.

Journal of Experimental Medicine, New York

68: 1-146 (July) 1938

Hormone Studies with Ultracentrifuge: I. Improved Air-Driven Vacuum Ultracentrifuge Suitable for Concentration Work in Biologic Experiments. J. A. Chiles Jr. and Aura E. Severinghaus, New York.—p. 1.

Effect of Repeated Superinfection on Potency of Immune Serum of Monkeys Harboring Chronic Infections of Plasmodium Knowlesi. L. T. Coggeshall and H. W. Kumm, New York.—p. 17.

Quantitative Relationship Between Immune Serum and Infective Dose of Parasites as Demonstrated by Protection Test in Monkey Malaria. L. T. Coggeshall and M. D. Eaton, New York.—p. 29.

*Fate of Nasally Instilled Poliomyelitis Virus in Normal and Convalescent Monkeys, with Special Reference to the Problem of Host to Host Transmission. A. B. Sabin and P. K. Olitsky, New York.—p. 39.

Vital Staining of Connective Tissues. L. S. King, Princeton, N. J.—p. 63.

Quantitative Studies of Brucella Precipitin Systems: I. Precipitation of Homologous Antiserums by Brucella Endo-Antigens. R. B. Pennell and I. F. Huddleson, East Lansing, Mich.—p. 73.

Id.: II. Precipitation of Heterologous Antiserums by Brucella Endo-Antigens. R. B. Pennell and I. F. Huddleson, East Lansing, Mich.—p. 83.

Immunization of Guinea Pigs Against Lymphocytic Choriomeningitis with Formolized Tissue Vaccines. E. Traub, Princeton, N. J.—p. 93.

Immunity of Mice Following Subcutaneous Vaccination with St. Louis Encephalitis Virus. L. T. Webster, New York.—p. 111.

Cutaneous Infectivity in Experimental Poliomyelitis: Increased Susceptibility After Neurosurgical Procedures. W. J. German and J. D. Trask, New Haven, Conn.—p. 125.

Nasally Instilled Poliomyelitis Virus.—With a method of intranasal instillation of poliomyelitis virus that brings about infection of all Macacus rhesus monkeys subjected to it, Sabin and Olitsky determined the fate of nasally instilled virus in normal and convalescent immune animals. Control experiments revealed that the nasal mucosa of normal monkeys contained no observable antiviral factors and that virus could be detected when five or ten minimal cerebral infective doses were added to the mucosa. In the olfactory bulbs even a single infective dose could be recovered, since suspensions of both bulbs could be transferred to the brain of a monkey without any loss of material. After nasal instillation of virus in normal monkeys it disappeared quickly (four hours or less) and could be recovered neither from the excised nasal mucosa nor from the olfactory bulbs during the first forty-eight hours. At seventy-two hours, just before or coincident with the first rise of temperature, virus was found in small amounts in the nasal mucosa and for the first time also in the olfactory bulbs. At ninety-six hours, at least three days before the appearance of nervous signs, and later, while virus continued to be present in considerable amounts in the olfactory bulbs (and presumably elsewhere in the central nervous system), none was detected in the nasal mucosa. In convalescent immune animals receiving the same strain of virus intranasally which caused the original infection, none could be recovered from the nasal mucosa or central nervous system at four hours or one, two, three, four, five and seven days. The possible significance of these data from an epidemiologic point of view is in the suggestion that persons who are immune because of a previous attack of the disease (not to be confused with natural resistance, which perhaps determines whether an attack of poliomyelitis will be apparent or inapparent) may no longer act as transmitters of the same strain or type of virus infection.

Journal Industrial Hygiene & Toxicology, Baltimore

20: 389-436 (June) 1938

Experimental Study of Heat Collapse. J. S. Weiner, Johannesburg, South Africa.—p. 389.

Ventilation of Wire Impregnating Tanks Using Chlorinated Hydrocarbons. C. P. Yaglou, F. W. Sands and P. Drinker, Boston.—p. 401.

Studies on Phenothiazine: VI. General Toxicity and Blood Changes. J. O. Thomas, J. B. McNaught and F. DeEds, San Francisco.—p. 419.

Toxicity of Isopropanol. H. J. Morris and H. D. Lightbody, Washington, D. C.—p. 428.

Experimental Investigations Concerning Liability to Silicosis Among Workmen in Iron Mines. C. Naeslund, Stockholm, Sweden.—p. 435.

Journal of Nervous and Mental Disease, New York

88: 1-140 (July) 1938

Concrete Model and Abstract Copy: Psychobiologic Interpretation of "Closing-In" Symptom of Mayer-Gross. W. Muncie, Baltimore.—p. 1.

Phenomenon of Transference in Case of Phobia (Anxiety Hysteria). F. Wittels, New York.—p. 12.

Clinical Syndromes of Echolalia, Echopraxia, Grasping and Sucking: Their Significance in Disorganization of Personality. D. E. Schneider, New York.—p. 18.

Use of Histamine Phosphate and Peptone Solution in Treatment of Neuroses and Psychoses: Preliminary Report. W. Marshall and J. S. Tarwater, Appleton, Wis.—p. 36.

Multiple Sclerosis: I. Etiologic Significance of Regional and Occupational Incidence. G. Steiner, Detroit.—p. 42.

Journal of Urology, Baltimore

40: 1-268 (July) 1938. Partial Index

Surgery of Horseshoe Kidney with Postaortic Isthmus: Report of Two Cases of Horseshoe Kidney. W. D. Jarman, Washington, D. C.—p. 1.

New Method for Instrumental Dilatation of Ureter. J. E. Dees, Baltimore.—p. 24.

*Similarity of Interstitial Cystitis (Hunner Ulcer) to Lupus Erythematosus. G. M. Fister, Ogden, Utah.—p. 37.

Cardiosclerosis Complicating Prostatism. W. S. Middleton, Madison, Wis.—p. 55.

Secretion of Alcohol by Genital Tract: Experimental Study. J. I. Farrell, Evanston, Ill.—p. 62.

Tuberculosis of the Male Genital Tract: Pathologic Study. J. G. Menville and J. T. Priestley, Rochester, Minn.—p. 66.

Cystoscopic Removal of Large Ureteral Calculi. E. P. Alyea, Durham, N. C.—p. 83.

Obstructions at Vesical Neck in Children. O. Grant, Louisville, Ky.—p. 114.

Hormone Treatment of Benign Prostatic Hyperplasia. H. W. E. Walther and R. M. Willoughby, New Orleans.—p. 135.

Influence of Anterior Pituitary-like Principle on External Genitalia of Young Boys. W. O. Thompson, N. J. Heckel and A. D. Bevan, Chicago.—p. 145.

*Clinical Experiments with Use of Male Sex Hormones: I. Use of Testosterone Propionate in Hypogonadism. S. A. Vest Jr. and J. E. Howard, Baltimore.—p. 154.

Recurrent Renal Lithiasis: Review of 100 Cases. C. C. Higgins, Cleveland.—p. 184.

Sodium R-Lactate Therapy in Acidosis of Renal Origin. R. Deakin, St. Louis.—p. 193.

Orchitis and Epididymitis Due to Undulant Fever. A. G. Isaac, Newton, Kan.—p. 201.

Use of Sulfanilamide in Genito-Urinary Infections. C. McMartin, W. H. Schmitz and W. J. McMartin, Omaha.—p. 233.

Interstitial Cystitis and Lupus Erythematosus.—Fister states that a study of interstitial cystitis and lupus erythematosus shows that the two disorders seem to have many points in common and suggests that they are possibly phases of the same disease—the one occurring in the wall of the urinary bladder, the other in the skin. Interstitial cystitis and lupus erythematosus usually appear in the second to the fourth decades of life. Both diseases are more common in women than in men by a ratio of about 3:1. The two diseases appear to be about equally rare. It is difficult to explain why more cases of interstitial cystitis are seen in this country unless it is that physicians are learning to diagnose the disease more frequently in its early stages. Neither interstitial cystitis nor lupus erythematosus is caused by an invasion of the diseased tissue with tubercle bacillus. Lupus erythematosus in many cases, however, is found associated with tuberculosis, but the local lesion has none of the characteristics of tuberculosis of the skin. The theory of multiple etiology of lupus erythematosus is rather generally accepted and tuberculosis may be the focus of absorption in some cases. Interstitial cystitis is definitely a nontuberculous infection of the bladder, but in many cases the symptoms are suggestive of tuberculosis and it is important to rule out tuberculosis of the urinary tract. It is possible that a distant tuberculous infection may act as the foci of toxin for the vesical involvement. It is now generally agreed that the two diseases are the result of absorption of toxins from some focus of infection, and one of these may be tuberculosis. Infected teeth, tonsils, nasal sinuses, infections of the urinary tract or local pelvic infections may all be endogenic sources of toxin absorption. The toxin theory, however, does not explain all conditions, nor does the removal of an evident focus of infection cure all cases. Trauma, external irritations of the skin, a weak peripheral circulation, associated cyanosis, telangiectasis, chilblains and circulatory disturbances are apparently exogenic factors in some cases of lupus

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erythematosus, while infections of the urinary tract, ureteritis, stricture of the ureter, perhaps childbirth, injury of the bladder, pelvic infections or circulatory changes in the wall of the bladder must be considered as possible additional factors in interstitial cystitis. The histopathologic changes of the two diseases are similar, but neither is of a specific character. Both have the characteristics of a chronic inflammation. The changes in the epidermis in lupus erythematosus are secondary to those in the corium and the changes in the mucous membrane in interstitial cystitis are secondary to those in the submucosa. Early in both diseases there is fibrous tissue hyalinization and fragmentation of the elastic tissue. In older lesions of lupus erythematosus, because of the progressive early changes, there results atrophy of the sweat and sebaceous glands, plugging of the follicles and atrophy of the epidermis, with an increase of the connective tissue and cicatricial formations. The later changes in interstitial cystitis consists of atrophy of the epithelium, various degrees of degeneration and ulcer formation. There is also proliferation of the connective tissue in the submucosa resulting in contraction of the vesical wall and cicatrization. Peripheral spreading of the infiltration with central degenerative changes occurs in the two conditions. Treatment of interstitial cystitis and lupus erythematosus has been along similar lines.

Testosterone Propionate in Hypogonadism.—Vest and Howard employed androgen (testosterone propionate) in five cases of primary testicular insufficiency due to castration, atrophy following trauma or an inherent defect in the testes and in one case of gonadal insufficiency secondary to demonstrable disease of the pituitary. Because of the known wide variation in the age of sexual maturation in man, their patients were only those with hypogonadism who were well past the normal age period of adolescence. Androgen seems to be a satisfactory replacement therapy for hypogonadism in the human being. It produces profound anatomic changes resulting in the proportionate growth of the phallus, scrotum, seminal vesicles and prostate, as well as development of pubic, axillary and extremity hair. There have been laryngeal changes (change to a more masculine voice), the appearance of considerable prostatic secretion and an ejaculum with coitus, and marked changes in the skin. There have been, in addition, changes in the general appearance, with improvement in the personality content. It has induced libido and potentia in persons in whom these had not existed previously, and restored normal sex life in a patient who was impotent following castration. No evidence of increase in tolerance to the drug has been observed.

Medical Annals of District of Columbia, Washington

7: 171-206 (June) 1938

Sulfanilamide Therapy from a Pharmacologic Point of View. G. B. Roth, Washington.—p. 171.
Advances in Study of Coronary Artery Disease. L. T. Gager, Columbia, S. C.—p. 180.
*Studies on Oxyuriasis: XV. Study of 504 Boys in a Boy's Camp. J. Bozicevich and F. J. Brady, Washington.—p. 187.
The "Acute Abdomen" in Children. E. A. Cafritz, Washington.—p. 191.
Syphilis and Crime. G. W. Creswell, Washington.—p. 194.
Vestibular (Bárány) Tests: Their Diagnostic Value in Labyrinthine and Intracranial Diseases. V. R. Alfaro, Washington.—p. 197.

Oxyuriasis.—One of the authors (Bozicevich) has reported an oxyuriasis incidence of 31.3 per cent on positive cases found by using only one NIH swab (stroking the perianal region with a glass rod tipped with a small square of cellophane and then examining the cellophane microscopically for pinworm eggs) on each of 230 boys at the Washington metropolitan police boys' camp during the summer of 1936. The investigation has been made again by Bozicevich and Brady during the summer of 1937 at the same camp, this time using repeated swabbings instead of one swabbing on 504 boys. Swabs were made on the boys the first thing in the morning before washing or defecating and often before dressing. Four swabbings were used in the examination of 329 boys, three swabbings for thirty-eight boys and two swabbings for 138 boys. In all, 289 persons harboring pinworms were found, an incidence of 57.3 per cent. Of these positives, 68 per cent of the cases were found by the first swab; repeated examinations revealed the remaining 32 per cent. Swabs not taken on consecutive days will reveal more cases than the same number of swabs taken consecutively. Analysis of the incidence according to age does not show a definite correlation but suggests that the incidence begins to decline after the age of 14. Of the negative group the average family size was 5.5 and of the positive group 6.65. Large families appear to be a factor predisposing to a high incidence.

Military Surgeon, Washington, D. C.

83: 1-112 (July) 1938

Development of International Cooperation Among the Health Authorities of the American Republics. H. S. Cumming.—p. 1.
Submarine Medicine. A. R. Behnke.—p. 6.
Contributions of the World War to Advancement of Medicine. I. J. Frisch.—p. 19.
Sulfanilamide in Treatment of Infectious Diseases. K. A. Brewer and E. P. Campbell.—p. 50.
Physical Therapy in the Next War. C. L. Lowman.—p. 63.
Modern Treatment of Typhoid Fever. A. G. Bower.—p. 70.
Combined Treatment of Meningococcic Meningitis with Meningococcus Antitoxin and Sulfanilamide: Case Reports. F. G. Norbury.—p. 76.
Value of Repeated Small Direct Blood Transfusions and Simplified Method Therefor. F. F. Rudder.—p. 79.
Importance of Psychiatry in Military Medicine. B. A. Strickland Jr.—p. 83.
Some Contributions of Military Surgeons to Medicine. H. A. Van Auken.—p. 88.

Missouri State Medical Assn. Journal, St. Louis

35: 197-232 (June) 1938

History of the Missouri State Medical Association: Address of the President. D. S. Conley, Columbia.—p. 197.
Some Medical Side Lights: Address of the President-Elect. B. W. Hays, Jackson.—p. 201.
Carcinoma of the Colon and Rectum: Surgical Discussion. R. V. Byrne, St. Joseph.—p. 205.
Diarrhea in Young People. E. J. Nienstedt, Sikeston.—p. 210.
Diabetes Mellitus with Lipemia Retinalis: Report of Case. A. W. McAlester 3d, M. L. Pepper and L. S. Milne, Kansas City.—p. 212.
New Treatment for Chronic Prostatitis and Seminal Vesiculitis. P. B. Nussbaum, Cape Girardeau.—p. 213.
Myoma of the Vagina. W. Berman, St. Louis.—p. 215.

New England Journal of Medicine, Boston

218: 991-1032 (June 16) 1938

Observations of a Rural Health Worker. A. Stampar.—p. 991.
*Localization of Intracranial Lesions by Electro-Encephalography. D. Williams, London, England, and F. A. Gibbs, Boston.—p. 998.
Observations on Convulsant Treatment of Schizophrenia with Metrazol: Report of Seven Cases. L. H. Cohen, Worcester, Mass.—p. 1002.
Spontaneous Thyroid Storm Associated with Diabetic Acidosis and Paralytic Ileus: Report of Case with Autopsy Findings. E. Deutsch, Boston.—p. 1007.
Incidence of Tuberculous Infection in Surgically Removed Tonsils. L. Alpert, Middleboro, Mass.—p. 1011.

Localization of Intracranial Lesions.—In order to ascertain the value of electro-encephalography, Williams and Gibbs used the method in eighty unselected patients suspected of having intracranial lesions. The oscillograph records were made with an ink-writing instead of with a cathode ray oscillograph as used by Walter. Fifty of the patients gave abnormal cortical potentials with evidence of focal disturbance. The oscillograph records of seventeen patients showed no cortical abnormality, and in thirteen the records were characteristic of epilepsy, without any evidence of a constant focus of discharge of slow waves. In thirteen of the fifty patients with foci of abnormal discharge operation was not performed, and the clinical diagnosis was too indefinite to verify the accuracy of the observations. In the remaining thirty-seven cases verification of the position of the abnormality was possible. In twenty-two the lesion was seen at operation or necropsy, in ten its position was established by unequivocal clinical observations, confirmed in four by x-ray evidence and in five a bone defect was present in the skull as a result of previous trauma. In every one of these thirty-seven cases the position of the single focus of abnormal discharge corresponded closely with the site of the organic lesion. In the twenty-two cases in which the cerebral lesion was seen the correlation of the electro-encephalogram with the operative and postmortem observations was striking.

New Orleans Medical and Surgical Journal

90: 697-772 (June) 1938

State Medicine: Presidential Address. C. M. Horton, Franklin, La.—p. 697.
Endocrine Deficiency in Syphilis. R. Hosen, Port Arthur, Texas.—p. 707.
Relationship of Rheumatic Fever to Subacute Bacterial Endocarditis. J. A. Holmes, New Orleans.—p. 711.
Low Cervical Cesarean Section. J. F. Dicks, New Orleans.—p. 720.
Classic Cesarean Section. P. J. Carter, New Orleans.—p. 723.
Preoperative and Postoperative Care and Complications of Cesarean Section. C. G. Collins, New Orleans.—p. 725.
Cesarean Section: Summary. H. E. Miller, New Orleans.—p. 726.
Review of the Cesarean Sections Performed in New Orleans During the Years 1927-1936, Inclusive. E. L. King, J. F. Dicks, J. W. Redditch, M. L. Stadiem, E. L. Zander, H. Meyer and E. P. McCormick, New Orleans.—p. 731.

New York State Journal of Medicine, New York

38: 917-968 (June 15) 1938

Carcinoma and Adenoma of the Rectum. R. C. Page, Tuckahoe.—p. 917.
Unusual Complication of Labor. F. A. Minas and D. J. Granbard, New York.—p. 920.
The Cinderella of Medicine. K. A. Menninger, Topeka, Kan.—p. 922.
Trigger Finger. C. W. Henson, New York.—p. 926.
Fibroma of the Ovary. J. F. Curran, R. H. Goodale and E. T. Crane, Worcester, Mass.—p. 927.
Hypodermic Needle in Stomach Wall. R. S. Rosedale, Buffalo.—p. 928.
Hemolytic Streptococcus Meningitis: Recovery in Case. B. Schwartz, New York.—p. 929.

Public Health Reports, Washington, D. C.

53: 935-960 (June 10) 1938

Effect of Moisture and Age on Stability of Neoarsphenamine. T. F. Probey and W. T. Harrison.—p. 939.
*Effect of Age of Neoarsphenamine on Reaction Expectancy. C. S. Stephenson, T. F. Probey and W. T. Harrison.—p. 945.
Flea Infestation of Domestic Rats in San Francisco, Calif. C. R. Eskey.—p. 948.

Reaction Expectancy of Neoarsphenamine.—According to Stephenson and his colleagues, the analysis of 541,381 administrations of neoarsphenamine to human beings from all medical services of the United States Navy, over a continuous period of five years, shows that the reaction expectancy increases with the age of the material. This clinical experience agrees with the laboratory observation that neoarsphenamine changes with age.

53: 961-1002 (June 17) 1938

Prevention and Control of Cancer: A Plan for Nationwide Organization. J. W. Schereschewsky.—p. 961.
*Effects of Intramuscular Injections of Vitamin B_1 on Acute Leprous Neuritis and of Oral Administration of General Disease: Preliminary Report. L. F. Badger and D. W. Patrick.—p. 969.
Studies on Oxyuriasis: XVI. Number of Eggs Produced by Pinworm, Enterobius Vermicularis, and Its Bearing on Infection. Lucy Reardon.—p. 978.
Rocky Mountain Spotted Fever: Geographic and Seasonal Prevalence, Case Fatality and Preventive Measures. B. C. Hampton and H. G. Eubank.—p. 984.

Vitamin B_1 in Leprous Neuritis.—During the last six months Badger and Patrick treated ten patients who had rather severe acute leprous neuritis of the peripheral nerves with intramuscular injections of thiamin chloride. The injections were begun as soon as possible after the onset of symptoms or when the patient first complained of pain. The procedure followed was to give 300 international units once a day by intramuscular injection and twice a day by mouth. In the seven cases in which the injections were begun on the day of onset, the pain disappeared completely twenty-four hours after the first injection in four, in forty-eight hours in one and on the fourth day in another. In one case, owing to a required emergency treatment, the injections were discontinued after two had been given and on the third day the pain was moderate, after which it continued to lessen in severity until the seventh day, when it was no longer present. Tenderness could no longer be elicited after twenty-four hours in one and after three or four days in all but the one case in which the treatment was interrupted. In this case no tenderness could be elicited on the seventh day. In each case the tenderness was less marked twenty-four hours after the first injection. Definite diminution in the swelling occurred about the time the tenderness disappeared. In one case the injection treatment was begun on the second day of symptoms, and twenty-four hours later the pain lessened definitely. The pain disappeared entirely after three injections, and after four injections the tenderness disappeared completely. In two cases the injections were begun on the fourth and fifth days of symptoms. In the former the response to treatment was not as abrupt and the improvement was not sharply defined from day to day. In the other case the results were about as prompt as in the majority of the cases.

Southwestern Medicine, El Paso, Texas

22: 209-252 (June) 1938

Medical Problems in New Mexico. E. W. Fiske, Santa Fe, N. M.—p. 209.
Selective Extrafascial Pneumothorax: Preliminary Study. J. W. Flinn and J. H. Allen, Prescott, Ariz.—p. 211.
Another Method of Pinning Fractures of Neck of Femur. J. M. Greer, Phoenix, Ariz.—p. 213.
Occurrence of Peptic Ulcer. F. J. Milloy, Phoenix, Ariz.—p. 215.
Poliomyelitis: Review. A. P. Black, El Paso, Texas.—p. 218.
Adequate Treatment of Syphilis. E. C. Fox, Dallas, Texas.—p. 223.
The Management of Serious Cases of Craniocerebral Injury. A. S. Crawford, Detroit.—p. 226.
Fever Treatment of Syphilis. H. M. Purcell, Phoenix, Ariz.—p. 229.

Tennessee State Medical Assn. Journal, Nashville

31: 209-250 (June) 1938

Meckel's Diverticulum: Report of Five Cases. B. McSwain, Paris.—p. 209.
Common Errors in the Management of the Cardiac Patient. W. R. Cate, Nashville.—p. 216.
Present Day Concept of Nephritis. C. A. Hartung, Chattanooga.—p. 222.
Self-Inflicted Skin Lesions. H. King and C. M. Hamilton, Nashville.—p. 229.
Near Death While Swimming, Due to Allergy to Heat and Effort. G. D. Grubb, Knoxville.—p. 234.

Virginia Medical Monthly, Richmond

65: 381-448 (July) 1938

The Management of Some Common Skin Diseases by the General Practitioner. M. B. Sulzberger, New York.—p. 381.
Coronary Thrombosis in a Twenty-Seven Year Old Man. E. G. Scott, Lynchburg.—p. 391.
Acute Coronary Thrombosis. H. Golston, Arlington.—p. 395.
Treatment of Burns in the Home. M. H. Harris, West Point.—p. 403.
*Hypodermic Use of Adrenalin for Differential Diagnosis Between Acute Pylorospasm and Ruptured Peptic Ulcer. J. T. Wolfe, Washington, D. C.—p. 405.
Insulin Shock Treatment of Dementia Praecox. F. A. Strickler and J. King, Radford.—p. 407.
Acute Head Injuries, with Particular Reference to Temperature, Pulse and Respiration Curves. H. Woodhall, Durham, N. C.—p. 413.
Remarks on Evipal Anesthesia. C. P. Jones, Newport News.—p. 419.
Sciatica. G. A. Duncan, Norfolk.—p. 420.
Congenital Megacolon Treated by Diathermy: Case. A. S. Hurt Jr., Richmond.—p. 424.
Use of Turnbuckles in Treatment of Fractures of Pelvis: Preliminary Study of Four Cases. R. D. Butterworth, Richmond.—p. 426.
Overactivity as Potent Factor in Etiology of Some Nervous Diseases. A. Gordon, Philadelphia.—p. 427.

Diagnosis of Pylorospasm and Ruptured Peptic Ulcer.—Wolfe reports five cases of acute pylorospasm, four patients being women and one a man. All were suffering with intense agonizing pain in the epigastric region. Examinations showed tympany over the stomach, varying degrees of shock, fixed attitude and tremendous anxiety. The abdominal wall in each case was tense and the character of the pain might easily have been confused with that caused by ruptured peptic ulcer. Tenseness of the abdomen differed from that of ruptured peptic ulcer because of the fact that it was slightly more yielding to palpation and not as rigid and boardlike as that caused by the latter condition. Five minims (0.3 cc.) of a 1:1,000 solution of epinephrine was given hypodermically to every patient and this produced marked relief of the spasm in the women within five minutes. In the man three doses at intervals of five minutes were required before the spasm began to subside. Acute pain from peptic ulcer due to local reflex spasm in the muscle fibers underlying the ulcer might be relieved and perforation prevented by the hypodermic use of epinephrine. If these patients were suffering from perforations, epinephrine would have had no effect. The use of epinephrine was prompted by the author's appreciation of the similarity of the neurophysiology involved in spasm of the digestive tract and of that in bronchospasm. Its use involved no risk and would have caused no delay had these been cases of ruptured peptic ulcer.

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FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

19: 171-238 (June) 1938

Immunologic Behavior of Fractions of Serum Globulin. J. Marrack and Dora A. Duff.—p. 171.
Transmission of Influenza Virus "W. S." to the Chinese Mink and the David's Squirrel. F. F. Tang.—p. 179.
Enzymic Activity of Vaccinial Elementary Bodies. M. G. Macfarlane and M. H. Salaman.—p. 184.
Further Studies on Combination of Vaccinia with Antivaccinial Serum: Action in Vitro of Neutralizing Antibody on Elementary Bodies. M. H. Salaman.—p. 192.
Artificial Opsonization of Bacteria: Part III. J. Gordon and W. R. Atkin.—p. 204.
Production of Staphylococcus α-Hemolysin in Chemically Defined Medium. G. P. Gladstone.—p. 208.
Influence of Transmitted Leukemia on Metabolism of Uninfiltrated Lymphoid Tissue. J. Victor and J. S. Potter.—p. 227.

British Medical Journal, London

1: 1193-1248 (June 4) 1938

The Changing Ground of Surgery. W. H. Ogilvie.—p. 1193.
Composition of Blood in Pregnancy. J. Ramsay, V. T. Thierens and H. E. Magee.—p. 1199.
Changes in Blood Pressure and Respiratory Volume Following Spinal Anesthetic. D. L. Lewis and E. G. M. Palser.—p. 1202.
Brief Review of 426 Consecutive Cases of Urinary Calculus. H. P. Winsbury-White.—p. 1204.
Bragg-Paul Pulsator in Treatment of Respiratory Paralysis: Report on Thirty-Four Cases. C. J. McSweeney.—p. 1206.
*Transfusion with Stored Blood. T. I. Wilson and J. M. M. Jamieson.—p. 1207.

Transfusion with Stored Blood.—Wilson and Jamieson give the details of fourteen instances (ten patients) of blood transfusion exemplifying the value of having a supply of blood in cold storage, ready for immediate use. The indications for transfusion were weakness and anemia associated with sepsis and malignant disease rather than the replacement of blood lost through hemorrhage, which was present in only three instances. Two deaths occurred in the period immediately following transfusion, one from syncope and the other from recurrence of hemorrhage. In three other cases the outcome was eventually fatal. None of these cases showed any reaction in the immediate post-transfusion period, and in no case could the fatal result be attributed to the administration of stored blood. Five of the patients—comprising eight transfusions—are alive after more than a year has elapsed. Among these are the two patients in whom reactions occurred. The procedure is a safe one.

Guy's Hospital Reports, London

88: 129-256 (April) 1938 (Partial Index)

Falling Incidence of Hour-Glass Stomach: I. Statistics from Guy's Hospital, New Lodge Clinic and Ruthin Castle. W. N. Mann.—p. 136.
Id.: II. Statistics from the General Infirmary at Leeds. M. J. Stewart and C. Stewart.—p. 139.
Epidemic Diarrhea and Vomiting and Sporadic Diarrhea. R. E. Smith.—p. 150.
Sodium Evipan as an Aid to Psychotherapy. A. M. G. Campbell.—p. 183.
*Intradermal Skin Tests in Diabetes Mellitus. S. F. Seelig.—p. 210.
Treatment of Asthma: Assessment of Results. E. R. Boland.—p. 218.
Observations on the Fourth Electrocardiographic Lead, with Special Reference to Its Initial Ventricular and Auricular Portions. A. Schott.—p. 224.
Heart Block Observed During a Period of Thirteen Years: Notes on Case. H. J. Starling.—p. 240.

Intradermal Tests in Diabetes Mellitus.—Seelig performed the intradermal test in fifty-one patients, of whom twenty were suffering from diabetes mellitus and thirty-one from diseases other than diabetes mellitus. On each flexor surface of the arms intradermal wheals were produced by an injection of 0.5 cc. of physiologic solution of sodium chloride and 0.5 cc. of a 0.1 per cent solution of dextrose, respectively. The time of disappearance of the wheals was compared. The results of the tests in the diabetic patients were uniform. In nineteen of the twenty cases the dextrose wheals disappeared more quickly than the ones caused by saline solution. If one assumes that the time of disappearance of an intradermal wheal containing a certain substance which is a constituent of the blood is indicative of the avidity of the skin for that substance, one may conclude that the skin of the diabetic patient has an increased avidity for dextrose. In no case of a group of twenty subjects not suffering from diabetes mellitus did the "dextrose wheal" disappear either before or at the same rate as the saline one. There remains a third group of patients, who though not diabetic show results which are identical with the "diabetic" type of reactors. Two persons in this group were highly dehydrated, while the other nine were suffering from conditions which may have a bearing on the water and sugar metabolism.

Irish Journal of Medical Science, Dublin

No. 140: 193-244 (May) 1938

Surgery and Duodenal Ulcer. G. Wright.—p. 193.
Fractures of Femoral Neck. A. Chance.—p. 210.
Some Tests for Determining Efficiency of Hospital Sterilization Plants: Note. J. McGrath.—p. 218.
Impressions of Accident Room in a General Hospital. E. M. Rees.—p. 225.

Journal of Physiology, London

93: 1-74 (June 14) 1938

Role of Leukocytes in Fat Absorption. E. H. Leach.—p. 1.
Mechanism of Production and the Physiologic Significance of "Apneusis." G. Stella.—p. 10.
Thermal Decomposition of Visual Purple. R. J. Lythgoe and J. P. Quilliam.—p. 24.
After Effects of Tetanus on Mammalian Muscle. G. L. Brown and U. S. von Euler.—p. 39.
Influence of Anterior Pituitary Extracts, Injected Either With or Without Insulin, on Glycogen Contained in Livers of Fasting Young Rabbits. H. P. Marks and F. G. Young.—p. 61.

Lancet, London

1: 1201-1258 (May 28) 1938

Biologic Thought and Chemical Thought: Plea for Unification. F. G. Hopkins.—p. 1201.
Clinical Features of Central Pain. G. Riddoch.—p. 1205.
*Chemotherapy of Pneumococcic and Other Infections with 2-(*p*-Aminobenzenesulfonamido) Pyridine. L. E. H. Whitby.—p. 1210.
Treatment of Acute Suppurative Otitis Media: Simplified Method Suitable for Unskilled Hands. A. Tumarkin.—p. 1212.
*Femoral Thrombosis. R. T. Payne.—p. 1214.

Chemotherapy of Infections.—Whitby finds that 2-(*p*-aminobenzenesulfonamido) pyridine possesses great chemotherapeutic activity against pneumococci of several types, more especially types I, VII and VIII, and also gives considerable protection against types II, III and V. Whereas most observers have found it easier to protect against type III than against type I, the reverse has been the case in the present series of experiments. The substance is not only highly protective against the Richards strain of hemolytic streptococcus in mice but is efficient in doses as low as from 1 to 2 mg. per gram of body weight of mice. The substance is active against meningococci. It appears to have a more polyvalent action than sulfanilamide, to be effective in low dosage and to have the great advantage, according to animal experiment, of being of low toxicity. There is evidence that it does not produce porphyrinuria. These experiments represent the one striking success in the chemotherapy of pneumococcic infections in an assessment of sixty-four related sulfanilamide compounds, some soluble, others insoluble.

Femoral Thrombosis.—Payne discusses a series of eighty-five cases of femoral thrombosis occurring in 1,300 cases of peripheral vascular or lymphatic disease. In all of these there was a definite cause, an acute onset and a varying period of disability. The thrombosis was associated with parturition or abortion in thirty-nine (with the postoperative state in seventeen), with typhoid in twelve and with infections of the lungs or pleura in seven. The remaining cases were associated with influenza, phlebitis, fracture, ulcerative colitis and erysipelas. The condition was bilateral in twenty-one cases, and in the unilateral cases the right side was involved in eighteen and the left in forty-six. In no patient in the entire series did the limb return entirely to normal. In two cases the evidence suggested a pure thrombosis, in sixty-one a pure lymphangitis and in twenty-two a combination of thrombosis and lymphangitis. Ulceration of the limb was present at some time or other in twenty-six of the eighty-five cases. These ulcers were chronic and intractable and associated with extensive inflammatory changes. Attacks of phlebitis occurred in nine cases, either in single attacks or in the form of recurrent attacks. It is estimated that some 5,000 cases of femoral thrombosis occur

annually in this country. The clinical evidence supports the view that lymphatic obstruction is responsible for the edema which is a characteristic feature of femoral thrombosis at all stages of the disease. From the experimental evidence, venous ligation will not produce edema. In patients dying as the result of a pulmonary embolus, the embolus is, as a rule, the first and final manifestation of a latent thrombosis, and but few of these patients have had the clinical manifestations of an antecedent "white leg." In cases of manifest femoral thrombosis a perivenous lymphangitis is the primary condition and this is followed by phlebitis and secondary thrombosis of the vessel. In these circumstances the thrombus is closely adherent to the wall of the vessel. In latent thrombosis that is without clinical manifestations the thrombosis is not associated with any perivenous change and the clot is but lightly adherent to the vessel. For this reason emboli are likely to occur.

1: 1259-1316 (June 4) 1938

Causation and Treatment of Dermatitis. R. Hallam.—p. 1259.
Use of Sulfanilamide in Treatment of Meningococcic Meningitis. E. C. O. Jewesbury.—p. 1262.
*Surgical Treatment of Pituitary Basophilism. A. R. D. Pattison and W. G. A. Swan.—p. 1265.
*Active Immunization Against Epidemic Influenza by Means of Elementary Body Suspensions Heated at 57 C. R. W. Fairbrother.—p. 1269.
Reticulocyte Response in Albino Rats After Injection of Gastric Juice. Gertrud Plaut.—p. 1272.

Pituitary Basophilism.—Pattison and Swan describe two cases of Cushing's syndrome in young women in whom improvement followed the insertion of radon seeds into the sella turcica. Both patients proved resistant to high voltage roentgen therapy and, in view of a progressive increase in blood pressure and the presence of gross osseous decalcification in the second patient, operation was considered to be justifiable. Although in the first patient no histologic confirmation of the pathologic condition is available there is no reason to doubt, on clinical grounds, that the case was a typical one of Cushing's syndrome. In the second patient the possibility of an adrenal tumor had been excluded by means of an exploratory laparotomy and the demonstration of the Crooke hyaline change. The relief from osseous pain that followed immediately after the implantation of radon seems to be analogous to that which may follow the removal of a parathyroid tumor in generalized osteitis fibrosa. The blood sugar curve showed a closer approximation to normal after operation than in the first patient, but the reduction of blood pressure and the hemoglobin percentage were approximately the same in the two patients. The implantation of radon has not provided a "cure" for the syndrome. On the other hand considerable improvement has followed the operation, and the menace of a progressively increasing blood pressure no longer exists. The disability resulting from osseous decalcification in the second patient has disappeared after the implantation of radon. The results following the use of 9 millicuries of radon in the second patient were not strikingly different to those following a dosage of 4 millicuries in the first patient, but the seeds in the first case were more favorably placed for influencing the activity of the pituitary, owing to the shape of the sella turcica. Although both patients are in a state of excellent subjective health their external configuration has been little altered. The general appearances are however much improved as a result of the disappearance of hirsutism of the face. In view of the doubtful part played by the basophil adenoma in Cushing's syndrome, it is the authors' opinion that treatment which aims at removing such a tumor is not rational.

Immunization Against Influenza.—Fairbrother finds that elementary body suspensions, heated at 57 C. for from thirty to forty-five minutes, constitute a useful immunizing agent against infection with the virus of influenza. The results obtained with mice and ferrets suggest that any differences given by the heated and living vaccines were due mainly to variations in the concentration of the virus in the suspensions. An appreciable antibody response was obtained by the inoculation of human volunteers and also a rabbit. These results suggest that heated elementary body suspensions should constitute an admirable immunizing agent for general application. Immunity following an attack of influenza is of only short duration. As there is no reason to suppose that artificially induced immunity will be as great as that following infection, specific prophylaxis is not likely to be beneficial except under certain circumstances. It appears necessary either to give a series of injections during the late autumn—i. e., before influenza usually occurs—or to wait until an extensive epidemic is expected. Protection is to be expected only against epidemic influenza and not against the sporadic forms, many of which are vague infections of the upper part of the respiratory tract. In order to control the efficacy of the vaccines, serologic tests should be carried out before and after inoculation.

Practitioner, London

140: 653-768 (June) 1938

Diseases of the Liver. A. Hurst.—p. 653.
Medical Aspects of Gallbladder Disease. A. E. Gow.—p. 665.
Surgical Aspects of Gallbladder Disease. J. Walton.—p. 674.
Malignant Disease of the Liver. F. Langmead.—p. 683.
Jaundice in Adults. A. C. Hampson.—p. 691.
Jaundice in Infants. R. E. Steen.—p. 705.
Laboratory Tests in Diseases of the Liver and Gallbladder. J. D. Robertson.—p. 713.
Diet in Health and Disease: XII. Diet in Disease of Liver and Biliary System. J. H. Anderson.—p. 721.
Gastroscopy. G. C. Dockeray.—p. 727.
Action of Sulfanilamide on Brucella Abortus Infections. P. Manson-Bahr.—p. 740.
Diagnosis of Tumors of Central Nervous System. J. M. Holmes.—p. 743.
Rehabilitation. J. P. Steel.—p. 751.

South African Medical Journal, Cape Town

12: 345-380 (May 28) 1938

Ambulatory Treatment of Varicose Veins. R. Simons.—p. 347.
Endemic Focus of Plague. L. Fourie.—p. 352.
Cerebral Tumor: Case. I. Sacks.—p. 358.

Chinese Medical Journal, Peiping

53: 513-632 (June) 1938

Studies on Etiology of Typhus Fever in North China. H. L. Chung and J. H. M. Chang.—p. 513.
Treatment of Old Posterior Dislocation of the Elbow. C. M. Meng.—p. 539.
*Vaccine Treatment of Diphtheria Carriers. H. Yü and A. E. Towers.—p. 553.
Anaphylactic Reactions During Dick Test and Active Immunization with Scarlet Fever Toxoid. K. C. Wang.—p. 559.
Guide to Identification of Anopheline Mosquitoes of the Colony of Hong Kong with Notes Concerning Them. R. B. Jackson.—p. 563.
Provincial Health Administration of Yunnan: Brief Report of Its Activities Since Its Establishment July 1, 1936-Dec. 31, 1937. H. Y. Yao.—p. 577.

Vaccine Treatment of Diphtheria Carriers.—Since the harmful action on the cell of Corynebacterium diphtheriae depends on antibacterial immunity, it is theoretically logical to treat carriers or patients whose throats persistently harbor the diphtheria organism with diphtheria vaccine. Yü and Towers made throat swabs from 120 nurses and cultures of these were taken for Corynebacterium diphtheriae. Two of the nurses were found to be healthy carriers. Among the cases of clinical diphtheria, the throats of six continued to show positive organisms with delayed resolution of Corynebacterium diphtheriae. Corynebacterium diphtheriae isolated in these eight cases were all smooth. With the exception of a culture isolated from a healthy carrier which was avirulent, the remaining seven cultures were all virulent. Each of these six carriers received 5,000 units of antitoxin, were kept in the isolation ward and were found carrying Corynebacterium diphtheriae for a period of from one to four months. The diphtheria vaccine used in this experiment was prepared from a smooth virulent strain of Corynebacterium diphtheriae. The two healthy carriers and the six convalescents were subjected to vaccine treatment, commencing with 0.2 cc. of vaccine (approximately 100 million organisms) injected subcutaneously. The strength of each subsequent injection was doubled. The interval between injections was three days. Throat swabs were made after each injection and cultures taken for Corynebacterium diphtheriae. Two patients were cured after the fourth injection of vaccine, while the rest cleared up after the fifth injection. A bactericidal test was performed by taking blood from vaccine treated persons before giving vaccine and two weeks after the fifth injection. The results demonstrate that the bactericidal power toward Corynebacterium diphtheriae is increased by vaccine treatment.

Archives des Maladies de l'Appareil Digestif, Paris

28: 433-552 (May) 1938

Volvulus of Stomach. P. Chêne and M. Ramadout.—p. 433.
*Diastasic Activity of Pancreatic Juice in Several Infectious Diseases. Garofeanu.—p. 468.
Vitamin B_1 in Diet and Question of Bread. H. Muller.—p. 475.
Chronic Pancreatitis of Atypical Evolution: Three Cases. J. Lorié. —p. 495.

Pancreatic Juice in Infectious Diseases.—Garofeanu points out that the older methods of examination of the diastasic activity of the pancreatic juice contained sources of error and that now only the direct method is regarded as suitable. This method consists in the examination of the fermentative activity of the enzymes in the duodenal juice, withdrawn following provoked secretion. This method discloses not only severe glandular changes but also the slight lesions of the gland which are likely to appear in diverse disorders. After citing the conditions in which this method has been employed by other investigators, the author says that he himself used the biologic examination of the duodenal fluid to determine the diastasic activity of the pancreatic juice in the course of infectious diseases. These researches were made on juice obtained after secretion had been provoked by ether and after preliminary evacuation of the bile following an intraduodenal injection of magnesium sulfate. The author cites the difficulties that are encountered in this method, particularly with the tubage and the introduction of ether. The latter provokes salivation, redness of the face, nausea, tachycardia and attacks of coughing. The author made his investigations on twelve patients with infectious diseases such as exanthematous typhus, typhoid, paratyphoid, scarlet fever, erysipelas, anthrax and influenza. To determine the fermentative activity of the lipase, he resorted to Bondi's method in the modification of Chiray and Milochevitch; for the evaluation of the diastasic activity of the trypsin he used the method of Goiffon and Nepveux. The results obtained with the latter method are recorded in two tables; the first one reveals the diastasic activity during fever and the second one during convalescence. The enzymatic activity showed a reduction, at least in certain cases, and the quantity of the duodenal juice was always diminished. The activity of the lipase was reduced in six of twelve cases; this reduction was most noticeable in two cases of exanthematous typhus and in one case of erysipelas. As regards the activity of the trypsin, it was diminished in five of twelve cases, the diminution being greatest in two cases of exanthematous typhus and in one case of paratyphoid A. Thus the reduction in the diastasic activity concerns the lipase or the trypsin or both. It is sometimes caused by the febrile state but in the majority of cases is due to an impairment of the gland.

Presse Médicale, Paris

46: 953-968 (June 18) 1938

Tuberculosis and Functionaries of the State. G. Poix.—p. 953.
*Intradermic Injections of Blood in Case of Rheumatic Pains. J. Le Calvé.—p. 956.
Are There Dangerous Universal Donors? P. Moureau, E. Balgairies and L. Christiaens.—p. 958.
Gonococcus and Chemotherapy. P. Barbellion and A. Garibaldi.—p. 960.

Injections of Blood in Rheumatic Pains.—Autohemotherapy, Le Calvé states, elicits a mild shock, which is well tolerated, increases the immunity, stimulates the reticuloendothelial system and desensitizes the organism against certain anaphylactic conditions. These factors make it logical to employ this treatment in rheumatic conditions, which are mostly allergic manifestations. Moreover, in rheumatism of Bouillaud's type, in which the author found that treatment with a sulfurated oil and sodium salicylate produces a more rapid improvement than did medication with salicylate alone, he observed also that he could obtain the same results by autohemotherapy together with several injections of the sulfurated preparation. In this connection the author cites the histories of two boys, aged 13 and 14 years, who had acute articular rheumatism. The first attack confined them to bed for twenty-five days and six weeks, respectively. Both presented the symptoms of endocarditis. During a second attack, a year later, two applications of autohemotherapy cured one in nine days, the other in six days. Another argument in favor of autohemotherapy is that it often exerts a calming influence on the pains. This action is especially noticeable when the reinjection of the blood is made into the painful zone. Still another consideration is that the albumins of the blood, extravasated in the tissues, are there subjected to the attack of proteolytic ferments. Digested and disintegrated, they are transformed into peptides, then into amino acids and in aminated bases with a predominating hypotensive action. Moreover, autohemotherapy provokes vasodilatation, a slight acceleration of the pulse and a reduction in the tension, and it exerts an influence on the nerves. It appears that the action of autohemotherapy, particularly its analgesic effects, are due to the liberation of histamine or of a related body. The disintegration of the injected blood does not take place suddenly but gradually, and the therapeutic action is thus prolonged. The author says that the number of intradermal injections varies: one or two injections, at a distance, of 2 or 3 cc. may be made at the painful points and several others around the area. At the same session, several regions may be treated. The rest of the blood can be injected into the buttock. The author cites the clinical histories of some of the cases in which he resorted to hemotherapy. In forty-two cases he found that the combination of autohemotherapy with injections of sulfurated oil produced better results than did the injection of the sulfurated oil alone, but he also obtained several cures by employing hemotherapy alone.

Revue de Chirurgie, Paris

57: 251-320 (April) 1938

Clinical Aspects and Pathogenesis of Ludwig's Angina. M.-B. Fabricant. —p. 251.
*Osteomyelitis with Pneumobacillus of Friedländer. Talbot and Parlange. —p. 271.
Glycemic Curves and Surgical Interventions. L. Bugnard, F. H. Columbies and A. Costes.—p. 290.
Section of Splanchnic in Certain Chronic Painful Syndromes of the Abdomen. R. Leriche and R. Fontaine.—p. 302.
Spina Ventosa Treated and Cured by Colloidal Bacillary Extract of Grimberg. R. Bloch.—p. 303.
Venous Spasm of Arms After Intra-Arterial Injection: Action of Infiltration of Stellate Ganglion; Phlebographic Control Before and After Infiltration. J. C. Dos Santos.—p. 308.

Osteomyelitis with Friedländer Bacillus.—Talbot and Parlange say that the pneumobacillus which was described by Friedländer in 1882 has for a long time been confused with the pneumococcus. This confusion can be explained by the presence of a capsule in both of them and by the fact that either may be present in pathologic processes of the lung. The septicemia with the pneumobacillus is encountered most frequently in the adult. It does not always exhibit the same clinical aspects, but most often it appears in the form of a pure septicemia without local manifestations. In other cases this septicemia is chiefly localized; it may be pulmonary or meningeal or it may become manifest in the form of a hepatocholecystitis, adrenalitis or aortitis. Moreover, the pneumobacillus has been known to cause septicopyemia. The authors observed a case of septicopyemia with the pneumobacillus of Friedländer, which was of otitic origin, with sinojugular thrombophlebitis and multiple localizations, one of which was an osteomyelitis. Osteomyelitis with Friedländer's bacillus is a rare disorder and is always grave. It is of an extremely tenacious character in that it reappears after apparent cure. The authors differentiate four anatomicopathologic forms of the osteitis caused by the Friedländer bacillus: (1) a periosteal form with abscess, (2) a form in which under the periosteal abscess an osteomyelitis was discovered, (3) a massive osteomyelitis and (4) a form of dry diaphysial caries. To the question whether the osseous processes caused by the Friedländer bacillus present characteristic symptoms that would facilitate the diagnosis and treatment, they give a negative reply. However, the torpid evolution should call attention to this type of process. The authors show that it is impossible to give general directions about the local treatment because practically all measures have been known to produce cure in one case and have been followed by death in others. The various types of shock therapy, they state, have so far been without appreciable results. Acriflavine hydrochloride has been used successfully by some investigators in septicemias with the pneumobacillus; moreover, some derivatives

of sulfanilamide have proved successful against some capsulated organisms. They themselves observed a rapid effect in the treatment with mandelic acid. They think that in the future chemotherapy will be of great importance in the treatment of pneumobacillary processes.

Helvetica Medica Acta, Basel

5: 299-408 (June) 1938

*Disease of Swineherds. F. Georgi, H. Pache and E. Urech.—p. 299.
Shock Therapy: Its Action on Proteic Equilibrium of Serum. G. Piotrowski.—p. 317.
Pharmacology of Lipoids, Lecithin, Cephalin, Cholesterol. F. Rothschild.—p. 329.
Experimental Metallic Osteodystrophies: Hepatorenal Elimination of Metals. M. Queloz.—p. 347.
Lutein Tissue and Bisexual Hormone. E. Fels and L. M. Diaz.—p. 366.

Disease of Swineherds.—Georgi and his associates point out that one of them described the first case of the "maladie des jeunes porchers" (disease of young swineherds) in 1931 and that since then the reports about this type of disease have multiplied. During the first eighteen months following the discovery of this disease they never had an opportunity to treat a relapse, and they were of the opinion that the first attack of the disease conferred an immunity. Recent observations, however, caused them to change their view. They cite six cases of the disease of swineherds in which relapses or recurrences developed. All the patients were cured without sequels, but in several cases the disorder was so grave that the differential diagnosis had to consider the possibility of meningitis, beginning septicemia, Brucella abortus infection or typhoid. The anamnesis, which directed attention to the occupational type of disease, had an important part in determining the correct diagnosis. Discussing the transmission of the disease, the authors say that they never observed contagion from man to man. All the persons who developed the disease were people coming in contact with hogs. In taking up the terminology of the disease the authors suggest that it be referred to simply as disease of swineherds rather than of "young" swineherds. Knowing the benign character of the disease of swineherds, they decided to use it as a substitute for malaria in fever therapy in the treatment of schizophrenia. In the course of these inoculations it was found that, just as in the animal experiments, the first inoculation produced fever but the subsequent ones did not. From these observations the authors conclude that the experimental inoculation confers immunity, of what duration is as yet unknown. After the spontaneous disease, however, the immunity is not always complete and lasting. In the concluding summary the authors say that the disease of swineherds is caused by a filtrable virus which is transmissible to man and animals. In man the period of incubation varies between six and thirteen days.

Haematologica Archivio, Pavia

19: 263-352 (No. 4) 1938

*Participation of Hemolymphopoietic System in Psoriasis. G. B. Cottini.—p. 263.
Hemorrhagic Aleukia with Reticulo-Endothelial Reaction. D. M. Bernardo.—p. 311.
Rouleau Formation of Erythrocytes Explained by New Theory of Structure of Blood. G. Triolo.—p. 335.
Analogies and Differences Between Acute Leukemia and Acute Erythremia. G. Di Guglielmo.—p. 341.

Hemolymphopoietic System in Psoriasis.—Cottini studied nineteen patients with psoriasis by a histopathologic study of lymph nodes removed by biopsy. The superficial lymph nodes are enlarged, hardened, painless and mobile. The enlargement parallels early evolution of the disease and stops as the latter enters the period of chronicity. Periadenitis is not present. Lymph nodes of the inguinal and axillary regions are the most frequently involved. The most interesting facts are the presence of eosinophilia, proliferation of the reticulo-endothelial cells of the lymph nodes and the presence of large deposits of pigments in the adenoid tissue. Eosinophilia is acute in the sternal bone marrow, taken by puncture, and moderate in the peripheral blood and the skin and lymph nodes. It is due to an allergic reaction of the sternal bone marrow to disintegrated cells. The reticulo-endothelial cells at the lymph nodes have a characteristic distribution and phagocytic properties. Tissues of the medullary portion are almost replaced by fibroblasts, especially near the hilus. The cortical portion is almost normal. It is the seat of a large number of phagocytes which contain melanin. The changes of the lymph nodes are acute in patients who have had the disease for a long time. The author feels that the metabolism of the skin and the interchanges between the skin and the epidermis are disturbed in the course of psoriasis. The disorder results in an increased passage of pigments to the lymph nodes. The latter react with proliferation of reticulo-endothelial cells with increased properties of fixation of the pigments.

Hospital, Rio de Janeiro

13: 957-1169 (June) 1938. Partial Index

*Appendicitis and Biliary Stasis. A. Brandão Filho and J. Vilela Pedras.—p. 979
Autonephrectomy or Exclusion of Kidney in Pyonephrotic Calculosis. Guerreiro de Faria and A. Fialho.—p. 989.
Cephalogiegic Syndrome of Fernandes Figueira. M. Vaz de Melo.—p. 1015.
Brown-Séquard Syndrome. F. de Oliveira Bastos.—p. 1019.
Antiamarillic Vaccine: Practical Advice. G. de Almeida.—p. 1061.
Cervicothoracic Sympathectomy in Paroxysmal Respiratory Syndromes. M. C. de Mota Maia.—p. 1077.

Appendicitis and Biliary Stasis.—Brandão Filho and Vilela Pedras say that many patients who had an appendectomy for chronic appendicitis report a continuation of the gastric disorders. The microscopic study of the removed appendixes confirms the indications of appendectomy. According to the authors, biliary stasis, which frequently coexists with chronic appendicitis, is the cause of the continuation of the gastric disorders after appendectomy. It is advisable to make an early diagnosis and treat the condition. Treatment consists in biliary drainage by Meltzer-Lyon's therapeutic test and administration of substances which stimulate the motor function of the gallbladder. The number of duodenal intubations varies from six to twelve. It is ruled by disappearance of the biliary stasis, which is verified by repeated roentgen examination of the gallbladder. The results of the treatment depend especially on early administration. If it fails, a surgical intervention on the gallbladder is indicated. Three cases are reported.

Archiv für orthopädische Chirurgie, Berlin

38: 579-748 (June 17) 1938. Partial Index

Conservative-Surgical Therapeutic Methods After Injury of Spleen. H. Galm.—p. 579.
Deformities of Spinous Processes. F. J. Irsigler.—p. 593.
*Surgical Treatment of Habitual Dislocation of Shoulder. R. Heep.—p. 615.
Chronic Arthritis and Mechanism of Wrist Joint. H. Virchow.—p. 634.
Dislocation of Semilunar Bone in Volar Direction and not Perilunar Dislocation of Hand in Dorsal Direction. A. Perschl.—p. 657.
Aspects of So-Called Symbrachydactylia. W. Eckinger.—p. 662.
Pathogenesis of Joint Mice in Talocrural Joint. H. Puhl and K. Lindemann.—p. 726.

Surgical Treatment of Habitual Dislocation of Shoulder.—Heep reviews the various surgical methods that have been recommended for the treatment of the habitual dislocation of the shoulder joint. He says that the operations on the muscles have been largely abandoned because they do not produce the desired results, and the simple ruffing of the capsule has likewise been discontinued because there are frequent relapses. Even the normal capsule is rather wide at the shoulder joint, so that it does not have the essential part in the habitual dislocation. The preferred therapeutic methods today are the interventions on the bone, and of these the extra-articular ones seem to be the best. At the author's clinic, Eden's operation is employed. This operation consists in the transplantation of a piece of the tibia into the anterior border of the glenoid cavity. The piece of bone must extend at least 1 cm. beyond the anterior border of the glenoid cavity. It must be covered with periosteum and must be fixed on the lower border of the glenoid cavity. This is accomplished either by means of periosteal sutures or by fixing the piece of bone to the neck of the scapula by means of a bone screw. Follow-up examinations one, two, three and five years after the intervention revealed that the results obtained with Eden's operation are quite satisfactory. The advantage of the operation is that it is an extra-articular intervention which makes the opening of the joint unnecessary. A disadvantage of the operation is that the approach to the

anterior portion of the glenoid cavity is rather difficult, particularly in obese persons. Moreover, the fixation is not easy. However, an experienced and competent surgeon will readily overcome these technical difficulties. The author reviews the clinical histories of six patients in whom this operation was performed. The last of the cases demonstrates that exactness is essential, for if the transplanted piece of bone does not extend beyond the anterior glenoid border the operation is a failure, because the piece does not act as a barricade.

Beiträge zur Klinik der Tuberkulose, Berlin

91: 569-650 (June 20) 1938

*Relation of Erythema Nodosum to Tuberculosis in Adults. E. Zweifel. —p. 569.
Action of Oxygen on Resorption of Pneumothorax Gases. G. Perschmann and F. Momsen.—p. 585.
Tuberculosis of Spleen During Senility. A. Arnstein.—p. 592.
Treatment of Large Cavities. K. Bönsdorff.—p. 605.
Experimental Contributions to Gold Therapy of Tuberculosis. S. J. Leitner.—p. 626.

Erythema Nodosum and Tuberculosis in Adults.—Following a review of the literature on the relation between erythema nodosum and tuberculosis, Zweifel reports his own observations in fifty-six cases of erythema nodosum which were observed at the medical policlinic of the University of Zurich during the years 1931-1936. The ages of the patients varied between 13 and 49, but the majority of the patients were about 20; forty-eight were females and eight were males. After citing some of the symptoms, such as the initial fever, the first appearance of the erythema on the anterior surface of the lower part of the leg or on the forearms and the painfulness of the nodules only on pressure, the author discusses, among other factors, the outcome of the tuberculin reaction, the concurrence of erythema nodosum with disorders of other organs and the results of the roentgenoscopy. In summarizing his observations, he says that of the forty-three adults in whom a roentgenogram was made twenty-two (51 per cent) presented tuberculous processes. These were nearly always of the type designated as "secondary infiltrations." In ten other cases (23 per cent) the changes were slight or questionable. In the other eleven cases (26 per cent) roentgenoscopy gave negative results. However, the author thinks that in the last two groups there may be cases in which the roentgenoscopy was made either too early or too late. If six additional cases (described by another author) and the case of a child are counted in, the percentage of the simultaneous occurrence of erythema nodosum with florid tuberculous pulmonary changes in the roentgenogram amounts to 56. In three cases relapses of erythema nodosum were observed. In ten cases articular involvement was observed, which in the presence of the roentgenologic aspects of the lungs was regarded as "Poncet-rheumatism" in the presence of erythema nodosum. The author states further that twenty-six positive tuberculin reactions were observed in thirty-three patients with erythema nodosum. It is noteworthy that in six of the seven patients with erythema nodosum who reacted negatively to the tuberculin test the roentgenogram indicated a tuberculous origin.

Münchener medizinische Wochenschrift, Munich

85: 897-936 (June 17) 1938. Partial Index

Prevention of Infection in Parenterally Administered Medicaments. F. Konrich.—p. 897.
*Tests According to Gudzent's Method in Rheumatism and Gout. E. Tancré.—p. 899.
Observations on Patients with Epidemic Encephalitis. H. Weil.—p. 901.
Therapy of Mastitis. W. Lüttge.—p. 906.
Is Vaccination Against Smallpox Still Necessary? H. Krauss.—p. 907.
*Pheochromocytoma of Adrenals: Concurrence with Neurofibromatosis. F. Brenner, H. Konzett and F. Nagl.—p. 914.

Gudzent's Test in Rheumatism and Gout.—Tancré admits that Gudzent's test method for rheumatism has been criticized by some investigators because many patients without rheumatism give positive reactions, whereas some with rheumatism give negative reactions. Moreover, some clinicians are of the opinion that rheumatism has no connection with allergy but is the result of infection. The author thinks that both theories, that of the exclusive allergic origin as well as that of the exclusive infectious origin, are too narrow. He emphasizes that the clinical aspects of rheumatism show such a great variety that a narrow etiologic interpretation is not justified. On the basis of his practical experiences he is convinced that the assumption of an allergic etiology of rheumatism is of great value. A large number of disorders, among them rheumatism, may result from an allergic condition. To be sure, it cannot be expected that in each rheumatic patient a positive reaction will result from Gudzent's allergic tests. However, in about 30 per cent of the patients with rheumatism, positive reactions are obtained which make it possible to identify the harmful factor. The exclusion of this factor may effect cure or improvement. The author does not deny that infections and exposure to cold may be causal factors in the development of rheumatism. In this connection he points out that tests on rheumatic miners yielded hardly any positive allergic reactions and he thinks that in these miners the rapid changes in temperature to which they were exposed may have been a causal factor in the rheumatism. The author employed the so-called allergenins of Gudzent in seventy patients with rheumatism and gout. The tests include those with meat, cereals, fish, milk, eggs, vegetables, bacteria, mold and control solution. The author gives brief clinical histories of several patients in whom positive reactions were obtained and in whom the exclusion of the offensive substances was followed by cure or improvement. He was able to prove that Gudzent's allergenins produce strictly specific reactions. Some of the patients gave positive reactions to one or two tests and negative reactions to all others. He emphasizes once more that in allergic tests on rheumatic and gouty patients, just as in the other so-called allergic disorders, positive results can be expected only in a certain percentage of the patients.

Pheochromocytoma of Adrenals.—Brenner and his associates consider the report of one case of chromaffin tumor of the adrenals justified because this case differs in several respects from those reported in the literature. The patient, a woman, did not present the symptoms that are characteristic for this type of disorder, and the multiplicity of symptoms made a diagnosis difficult. The condition of the urine, the hypertension and the changes in the fundus oculi suggested an acute nephritis. However, there were also several aspects which could not be explained on the basis of a renal disorder, and some symptoms of renal disease were lacking. Periarteritis nodosa was another disorder that was taken into consideration. The necropsy disclosed, besides other pathologic changes, a pheochromocytoma originating in the medullary cells of the left adrenal. The tumor weighed 300 Gm. What makes this case especially interesting is the concurrence of a chromaffin tumor of the adrenal with a neurofibromatosis. In this connection the author points out that the simultaneous occurrence of these two conditions has been reported repeatedly. Among the sixty-four cases of chromaffin tumors of the adrenals hitherto reported, there were eight in which neurofibromatosis existed simultaneously. This concurrence of the two disorders has been regarded as the manifestation of a systemic disease of the nervous system in which brain, spinal cord and peripheral nerves as well as the sympathetic and its derivatives may be involved. The authors also determined the epinephrine content of the tumor and found it exceptionally high. They think that this explains the high blood pressure and the tachycardia which were observed in the woman.

Polska Gazeta Lekarska, Lwów

17: 561-584 (July 3) 1938

Secondary Thrombopenia. A. Rytel and M. Dziewanowski.—p. 561.
Spontaneous Rupture of Ovarian Cyst: Case. J. Lenczowski.—p. 563.
*Therapy of Myoma of Uterus by Radium. M. Seidler.—p. 565.
Intracranial Complications of Otitis Media. W. Jankowski.—p. 568.
New Methods of Therapy of Infections. N. Dab.—p. 573.

Radium Therapy of Myoma of Uterus.—Seidler reports thirty-nine cases of myoma of the uterus observed during the last four years in which radium treatment was administered. He used radium in cases in which surgical intervention was contraindicated either because of severe anemia or because of hemorrhage. Hemorrhages were immediately stopped by application of radium. In one case the myoma was as large as a hen's egg, with severe hemorrhage, but after the administration of 3,600 mg. hours the hemorrhage was stopped. Myoma occurred in twenty-nine multiparas and ten primiparas. He separated them according to age in three groups: In group 1

there were three patients ranging in age from 20 to 30 years, in group 2 there were twenty-five patients from 30 to 40 and in group 3 there were eleven patients over the age of 40. The dosage was from 930 to 5,000 mg. hours, according to the age and size of the tumor. The mortality rate after operation is from 2 to 5 per cent and after radium therapy about 0.2 per cent. The genital organs of the patient are saved and the hormone action reappears after a few months.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

82: 3059-3190 (June 18) 1938. Partial Index

Calcification of Foci in Lung in Course of Pulmonary Tuberculosis. J. H. Reichart.—p. 3065.
*So-Called Aleukemic Megakaryocytic Myelosis. G. A. Lindeboom.—p. 3072.
Use of Metals in Surgery. A. H. Smook.—p. 3080.
Fatality Following Treatment with Insulin Shock According to Sakel: Method. A. P. Timmer.—p. 3088.

Aleukemic Megakaryocytic Myelosis.—Lindeboom points out that in the group of aleukemic leukemias a form has been recognized in which the pathologic anatomic examination of the spleen and liver disclosed giant cells. These giant cells have been considered to be megakaryocytes and the disorder has been designated as aleukemic megakaryocytic myelosis. In recent years it has been suggested that this disorder presents an independent disease entity. It develops mostly in middle-aged persons, more often in women than in men. It is a chronic disease which develops insidiously. The enlargement of the spleen, which is usually considerable, dominates the clinical picture but its discovery is usually accidental. Fatigue, enlargement of and a sensation of heaviness in the abdomen and piercing pains in the region of the spleen are the chief complaints. The enlargement of the liver is usually much less noticeable than that of the spleen. The lymph nodes are not swollen. The temperature may be subfebrile. The examination of the blood usually reveals a mild to moderate orthochromic or hypochromic anemia, which during the later stages may become more severe. The resistance of the erythrocytes is often somewhat reduced. The number of leukocytes may be entirely normal or they may be slightly reduced or greatly increased. In nearly all cases a more or less severe myeloid reaction is noticeable. The considerable polychromasia and the anisocytosis and poikilocytosis are surprising in view of the moderate anemia. The author reports the clinical histories of two patients who had this disorder. Discussing the placement in the nosologic system, the author doubts that the disorder can be classified with the leukemias and suggests that it stands between the leukemias and the pure endotheliоses and is a hepatolienal hematopoietic endotheliosis. Regarding the treatment, he says that the effect of roentgenotherapy is usually slight. In one of the reported cases it was followed by a temporary improvement. The splenectomy caused no improvement, for the condition of the patient was less good than it had been before the operation. However, the French literature reports some successes with this treatment and recommends the early removal of the spleen.

Acta Medica Scandinavica, Stockholm

93: 539-606 (June 11) 1938

Exophthalmos in Exophthalmic Goiter. L. Polak Daniels.—p. 539.
*Icteric Form of Glandular Fever. S. I. de Vries.—p. 552.
Normal Values for Hemoglobin, Erythrocytes and Cell Volume Percentage and the Corpuscular Constants Derived Therefrom in Children Aged from 8 to 18 Years: Examinations of Three Hundred School Children in Stockholm. P. Fergeman.—p. 566.
Bacterium Alkalescence in Infections of Urinary Tract and Its Relation to Dysentery Bacilli. E. Neter.—p. 597.

Icteric Form of Glandular Fever.—De Vries does not consider glandular fever to be a rare disease nor does he think that the cases corresponding to Pfeiffer's original description are the most common. Careful clinical studies have disclosed widely different types which have certain distinct characteristics in addition to the main symptoms of the disease: fever, general adenopathy and lymphomononucleosis. Atypical forms of glandular fever were first recognized by Glanzmann and Tidy. The three aforementioned characteristic symptoms are not necessarily present in the atypical cases. Fever and adenopathy have been known to be absent or to be present in only a mild degree. Although some authorities hesitate to recognize glandular fever in such a form, the author believes that, although rarely, the disease does occur in such a form. The diagnosis is dependent on two essential factors: (1) the typical morphologic blood picture and (2) the positive antibody test of Paul and Bunnell. Following a discussion of these hematologic and serologic aspects, the author reports the clinical histories of three cases which illustrate the value of the hematologic and serologic examinations, since the clinical signs alone would have suggested the diagnosis "jaundice." Neither fever nor adenopathy was sufficiently prominent to seem of value for the diagnosis. The author says that in the future in every case of jaundice a blood count and the antibody test of Paul and Bunnell should be made. In true infectious jaundice, as opposed to infectious mononucleosis, a leukopenia with lymphocytosis and deviation toward the left without atypical cell types, without pathologic changes in the lymphocytes and with a negative Paul and Bunnell reaction will be found.

Acta Obstet. et Gynec. Scandinavica, Stockholm

18: 125-244 (No. 2) 1938. Partial Index

Progestin Content in Mature and Young Human Placentas. J. Haffner.—p. 125.
*Pregnancy Complicated with Diabetes. E. Brandstrup and H. Okkels.—p. 136.
Way to Achieve Painless Confinements. P. Wetterdal.—p. 174.
Relief of Pains in Childbirth: Reports from Studies in the United States, England and Germany, September 1936 to April 1937. Margit Insulander.—p. 179.
Some Observations on Blood Vessels of Uterus Under Normal Conditions and in Myoma. B. Holmgren.—p. 192.
Course of Pregnancy, Delivery and Puerperium in Primiparas with Excess Weight. E. Møller-Christensen.—p. 222.
External Endometriosis and Sterility. A. Turunen.—p. 237.

Pregnancy Complicated with Diabetes.—Brandstrup and Okkels point out that the literature on diabetes and pregnancy from the preinsulin days gives a gloomy outlook for the mother as well as for the child. There was a maternal mortality of 30 per cent in direct connection with pregnancy or parturition, and not more than 50 per cent of these patients were alive as long as two and a half years after the parturition. As to the children, the outcome was even worse, as abortion, intra-uterine death of the fetus and death of the child during delivery or within the first days of life occurred so frequently that the total death rate for the fetus exceeded 60 per cent. The discovery of insulin has brought about a complete revolution. Young women with diabetes do not die of diabetes, and they conceive far more frequently than before. While it is possible with modern therapy to make the female diabetic patient free from symptoms, enabling her to work and to conceive, it is not always practicable to bring her safely through pregnancy and parturition. The material here presented comprises twenty-two instances of pregnancy in nineteen diabetic patients observed in the Lying-in Department A, Rigshospital, Copenhagen. This material is not suggestive of any change in the diabetic condition of the mothers during pregnancy. The restitution of these patients after the puerperium indicates that such changes as have been observed during pregnancy (frequency of acidosis and changes in the insulin requirement) are attributable to factors of a nature that does not directly concern the diabetic condition. The obstetric risk is somewhat increased through a tendency to hydramnios, excessive size of the child and, especially, infection in the presence of eczema of the vulva. In the twenty-two cases observed, only ten living children were discharged from the hospital. The great mortality among children of diabetic patients may probably be attributed to maternal hyperglycemia and acidosis. In three of the dead children the necropsy was extended to include a thorough microscopic examination of the endocrine organs. The pathologic changes observed in the pancreas, hypophysis and thyroid are described. Commenting on these changes, the authors say that the maternal hyperglycemia alone brings about the pathologic changes in the child. In the discussion of the therapeutic problems, it is pointed out that in the future the main task of the treatment should be to employ such dietetic and medicinal measures as to make obstetric operations unnecessary. The pregnant diabetic patient must be watched closely, and the efforts must be aimed at the avoidance of hyperglycemia and acidosis. The therapeutic significance of protamine zinc insulin is emphasized.